Universitatea Tehnică din Cluj-Napoca
18 octombrie 2022

Doctor Honoris Causa

Profesor univ. dr. Daniela Rus

Director

Computer Science & Artificial Intelligence Laboratory

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

LAUDATIO

În onoarea doamnei profesor dr. Daniela Rus
de la Massachusetts Institute of Technology, SUA
cu ocazia acordării titlului de Doctor Honoris Causa
al Universității Tehnice din Cluj-Napoca, România

Stimate Domnule Rector al Universității Tehnice din Cluj-Napoca
profesor Vasile Țopa,
Stimate Domnule Presedinte al Senatului Profesor Nicolae Burnete,
Stimate Domnule Vicepreședinte al Senatului profesor Vasile Dădârlat,
Dragi membri ai Senatului,
Dragi invitați,
Dragi colegi,
Doamnelor și domnilor,

Universitatea Tehnică din Cluj-Napoca are astăzi plăcerea de a aduce un profund respect doamnei Daniela Rus, profesor la Massachusetts Institute of Technology din SUA, personalitate științifică și academică remarcabilă în robotică și inteligență artificială.

Sunt onorat că, în numele comunității academice a Universității Tehnice din Cluj-Napoca, să vă prezint în fața dumneavoastră cele mai semnificative rezultate ale carierei profesionale și științifice impresionante care caracterizează personalitatea complexă a profesorului Daniela Rus.

Recunosc de la bun început că am avut o sarcină de înaltă responsabilitate de a sintetiza în câteva propoziții realizările personalității remarcabile întruchipate de profesorul Daniela Rus. Cu toate acestea, a fost o misiune foarte onorabilă pe care am îndeplinit-o cu cea mai mare plăcere.

Despre activitatea complexă și laborioasă a profesorului Daniela Rus, cu rezultate excepționale în crearea și aplicarea cunoștințelor din domeniul roboticii și inteligenței artificiale, aș putea spune multe cuvinte. Cu toate acestea, acest eveniment festiv mă pune în situația de a rezuma realizările sale profesionale remarcabile la câteva repere reprezentative.

Daniela Rus este profesor de inginerie electrică și informatică la MIT, SUA și director al Laboratorului de Științe Informatice și Inteligență Artificială (CSAIL) al MIT. Este decan asociat de cercetare pentru Colegiul de Calcul Schwarzman de la MIT.

Obiectivul cercetării Danielei Rus este de a dezvolta știința și ingineria autonomiei, mai ales atunci când grupurile de roboți interacționează între aceștia și cu oamenii în vederea obiectivului pe termen lung de a permite un viitor cu mașini integrate omniprezent în viața noastră, sprijinind oamenii cu sarcini cognitive și fizice.

Cercetarea sa abordează unele dintre decalajele dintre locul în care se află astăzi agenții, fie că sunt încorporați sau nu, și promisiunea agenților omniprezenți: creșterea capacității mașinilor de a raționa, de a învăța și de a se adapta la sarcini complexe în medii centrate pe om, dezvoltarea de interfețe intuitive între roboți și oameni și crearea de instrumente pentru proiectarea și fabricarea de noi roboți rapid și eficient.

Aplicațiile acestei activități de cercetare sunt largi și includ demonstrații în transport, producție, agricultură, construcții, explorare subacvatică, orașe inteligente, medicină, monitorizare și sarcini la domiciliu, cum ar fi gătitul. Cercetarea ei răspunde la întrebările: cum putem construi mai rapid mașini cu funcția dorită? Cum putem construi mașini autonome cu capabilități din ce în ce mai complexe și cum pot colabora multe mașini pentru a atinge un obiectiv comun? Pentru fiecare dintre aceste întrebări, un obiectiv important este ca sistemul în ansamblu să aibă un comportament garantat.

Robotica distribuită este un domeniu important al roboticii, deoarece abordează modul în care roiurile de roboți pot colabora pentru a realiza o sarcină mai mare decât este capabil să facă fiecare robot individual. Cercetarea sa se referă la dezvoltarea algoritmilor care permit proiectarea și fabricarea, controlul autonom și colaborarea.

Dânsa a demonstrat în continuare o extindere importantă a ideilor din robotica distribuită la rețelele de senzori și detecție distribuite. A avut anterior lucrări în geometrie sau în sisteme; munca sa se referă la construirea și înțelegerea sistemelor robuste combinând aceste considerații. O temă importantă în această activitate de cercetare este auto-organizarea: studiul proceselor computaționale care interacționează între ele și cu lumea fizică prin intermediul percepției, comunicării și schimbării pentru a realiza reconfigurarea sistemului ca răspuns la cerințele sarcinii și a mediului. Prof. Daniela Rus și studenții săi au contribuit cu rezultate importante la proiectarea și controlul roboților pentru sisteme multi-roboți și pentru sistemele de robot soft.

Cercetarea prof. Daniela Rus include trei componente cheie:

• proiectarea și construirea de noi mașini autonome capabile să realizeze sarcini din ce în ce mai complexe fără supraveghere umană, inclusiv unii dintre primii roboți autonomi și sisteme de roboți modulare auto-organizate; astfel de sisteme cu diverse forme noi și construite dintr-o mare varietate de materiale extind gama noastră de roboți;

• dezvoltarea algoritmilor pentru aceste noi mașini și analiza capacităților fizice ale acestor mașini;

• dezvoltarea algoritmilor de învățare automată implementabili axați pe scalabilitate, performanță, robustețe și capacitatea de a conecta raționamentul la control; și

• aplicarea noilor capabilități la problemele din transport, producție, agricultură și viața de zi cu zi.

Cercetarea prof. Daniela Rus abordează studiul științei și ingineriei autonomiei ca sisteme integrate hardware-software sau corp-creier. Dânsa vede corpul robotului ca fiind esențial în definirea gamei de capabilități ale robotului, iar creierul este esențial pentru a permite corpului să-și dezvolte capacitățile. În acest scop, dânsa a dezvoltat o serie de algoritmi pentru proiectarea de calcul și fabricarea roboților.

Cercetarea sa privind dezvoltarea Robot Compiler introduce o abordare computațională pentru proiectarea corpului robotului mecanic (pentru sisteme de robot pliate), a substratului său electronic și a infrastructurii de control la nivel scăzut din specificații de nivel înalt a câștigat premiul pentru cea mai bună lucrare la IROS 2014.

Munca sa la proiecte noi de roboți a contribuit la mai multe platforme de robot noi cu capacități noi, AMOUR, robotul subacvatic plutitor, Miche și Pebbles, roboți modulari care ating formele dorite prin auto-demontare, M-Blocks, sistemul de robot modular cu auto-organizare, SoFi, peștele-robot moale, roboații, o barcă robotizată dreptunghiulară modulară, prinderea Origami Magic Ball, prinderea robot soft și puternică care folosește un mușchi artificial nou condus de fluid, capabil să ridice de până la 1000 de ori greutatea sa și pilula robot MiniSurgeon , un sistem origami realizat din carcasă de cârnați conceput pentru operații fără incizie, printre multe altele.

Lucrările prof. Daniela Rus privind proiectarea roboților extind noțiunea noastră despre structuri robotizate, prin introducerea unei game de noi forme și materiale pentru crearea roboților.

Prof. Daniela Rus a contribuit cu câțiva algoritmi de sisteme multi-roboți cu garanții de performanță în robotica distribuită prin introducerea unei abordări de optimizare control-teoretică pentru coordonarea adaptivă descentralizată. Cheia acestor rezultate este cuplarea strânsă dintre percepție, control și comunicare. Algoritmii de control sunt descentralizați, adaptabili și stabili. Ei au fost plasați în echipe de roboți și noduri de senzori pe sol, în aer și în apă.

Prof. Daniela Rus a fost prima care a oferit o soluție în timp real pentru acoperirea distribuită adaptivă cu o echipă de roboți autonomi capabili să comunice cu vecinii, atunci când funcția senzorială este necunoscută. Acest algoritm stă la baza unei abordări generale a controlului descentralizat pentru echipele de roboți al căror scop poate fi formulat ca un anumit tip de funcție de cost. Abordarea a fost utilizată pentru acoperire adaptivă, explorare și asamblare. Rezultatele au fost extinse cu modele adecvate de percepție și comunicare pentru vehiculele subacvatice și aeriene și au fost demonstrate în experimente de teren.

Munca fundamentală a profesorului Rus în controlul rețelei a făcut o punte între comunitatea robotică și comunitatea rețelei de senzori. Mai precis, munca Prof. Daniela Rus a oferit o abordare riguroasă a sintetizării controlerelor descentralizate adaptive care sunt stabile și convergente și care permit o serie de capabilități colective ale robotului, cum ar fi eșantionarea și explorarea adaptive, controlul formațiunii care este adaptabil la obstacolele dinamice, asamblarea colaborativă, realizarea de hărți distribuite și sisteme de transport optime din punct de vedere social, printre altele. Aceste probleme au fost formulate ca optimizare cu funcție de cost și consens, iar modelarea și analizele garantează că sistemele ating convergența în timp real prin utilizarea consensului.

Prof. Daniela Rus a contribuit, de asemenea, la dezvoltarea domeniului sistemelor robotizate modulare prin dezvoltarea algoritmilor timpurii pentru planificarea de auto-reconfigurare a roboților modulari. Dânsa a explorat mai multe modalități de auto-reconfigurare. Într-un grup de cercetări, reconfigurarea este realizată atunci când modulele individuale călătoresc pe suprafața structurii agregate conform planurilor de reconfigurare care calculează secvența de mișcări pentru fiecare modul. Un alt grup de lucrări examinează reconfigurarea prin deplasarea prin volumul structurii utilizând acționarea prin scalare. Un al treilea corp de lucrări examinează auto-reconfigurarea prin auto-dezasamblare. În fiecare dintre aceste lucrări, contribuțiile includ algoritmi și proiecte de planificare și platforme fizice care demonstrează noi capabilități. Lucrările timpurii au examinat sisteme de robot modulare capabile să se deplaseze pe suprafața structurii.

Prof. Daniela Rus a fost un pionier în dezvoltarea domeniului roboticii soft. Munca ei se referă la proiectarea, fabricarea și controlul roboților moi. Lucrarea sa cu studenții a introdus primele sisteme de robot autonome și autonome implementabile – sub formă de pești robot moi, mâini moi de robot și manipulatoare de robot moi.

Robotica soft este un domeniu al roboticii foarte important și în creștere rapidă, care are potențialul de a introduce o eră a roboților siguri pentru medii centrate pe om.

Roboții tradiționali sunt adesea prea rigizi pentru mediile centrate pe om în care sarcinile sunt imprevizibile, iar roboții trebuie să se asigure că interacțiunea lor cu mediul și cu oamenii este sigură.

Manipulatoarele industriale de astăzi permit asamblarea rapidă și precisă, dar acești roboți sunt izolați de oameni, deoarece implică riscuri. În schimb, roboții moi au corpuri realizate din materiale intrinsec moi și/sau extensibile (de exemplu, cauciucuri siliconice sau țesături) și sunt siguri pentru a fi în preajmă. Au o structură deformabilă continuu cu acționare asemănătoare mușchilor care emulează sistemele biologice și le oferă grade relativ mari de libertate. Un robot care își poate deforma corpul în mod continuu este capabil să învelească un obiect și să construiască un contact de suprafață, spre deosebire de un robot cu corp rigid, care este capabil să facă contact doar discret cu obiectul în timp ce îl învăluie. Provocarea controlului soft al robotului este foarte complexă atât la nivel teoretic, cât și tehnologic.

Prof. Daniela Rus și studenții și colaboratorii săi oferă primele soluții pentru controlul membrelor moi ale robotului cu fundamente teoretice și valabilitate în practică. Combinând un punct de vedere teoretic solid, cu capacitatea de a aplica teoriile sale în practică, această lucrare a fost prima execuție demonstrată a mișcărilor precise și rapide cu roboți cu corp moale. Aceste rezultate au contribuit la noi sisteme capabile de interacțiune fiabilă și controlată cu un mediu nestructurat -- o sarcină fundamentală atunci când se consideră că roboții moi sunt făcuți pentru lucru în situații nestructurate și pentru interacțiunea cu mediul. Aceste idei tehnice au dus la mai multe dispozitive noi, inclusiv peștele robot moale SoFi care înota autonom în medii naturale de recif de corali (Science Robotics 2018), Origami Magic Ball Gripper, un efector moale puternic, capabil să ridice de 100 de ori greutatea sa (ICRA 2019), un sistem robotic moale modular la scară, capabil de locomoție cu picioare și de plasare (Soft Robotics 2021), module robotice moi cu piele (RoboSoft 2021), prindere moi auxetice de forfecare cu mână care sunt acționate electric (Science 2018, RoboSoft 2018), JelloCube, un robot cub moale capabil de sărituri continue (IEEE Transactions on Mechatronics 2019).

Prof. Daniela Rus are în vedere, de asemenea, funcționarea pe termen lung a mașinilor, concentrându-se pe învățarea robustă și a sarcinilor complexe scalabile. De exemplu, lucrarea AAAI 2020 introduce o metodă de a învăța mașinile cu stări finite care reprezintă politici din comportamentul experților care sunt interpretabile și manipulabile prin utilizarea unui model ierarhic neparametric Bayesian profund.

Interpretabilitatea se realizează prin modelarea interacțiunilor dintre acțiunile de nivel înalt ca un automat cu conexiuni la logica formală. Manipulabilitatea se realizează prin integrarea acestui automat în planificare, astfel încât modificările aduse automatului au efecte previzibile asupra comportamentului învățat.

Rezultatele recente privind robustețea și scalabilitatea sunt abordate în lucrările sale ICLR 2019 și ICLR 2020 care abordează compresia și tăierea care realizează o reducere foarte mare a parametrilor (peste 90% pentru testele standardizate) cu garanții. Lucrările sale privind învățarea end-to-end includ învățarea de la oameni cum să conduci vehicule (cel mai bun finalist al lucrării la ICRA 2019) și dezvoltarea de simulatoare fotorealiste care sprijină controlul sim-to-real și generarea unor puncte de cotitură pentru conducerea autonomă.

Pe lângă faptul că a contribuit fundamental la proiectarea, controlul, planificarea și învățarea agenților, prof. Daniela Rus a considerat și ceea ce este necesar pentru ca roboții să fie dislocați în lume. Un exemplu este proiectul său de a dezvolta vehicule autonome. Munca sa a dus la dezvoltarea și implementarea a 9 vehicule autonome, inclusiv o mașină Toyota Prius, o mașină Mitsubishi iMiev, mai multe mașini de golf și mai multe scaune cu rotile autonome.

Aspectul de control al conducerii autonome al acestor lucrări se concentrează pe dezvoltarea de noi algoritmi de planificare, control și învățare automată pentru sisteme autonome, cum ar fi mașinile. Această cercetare urmărește creșterea capacităților de luare a deciziilor ale vehiculelor autonome, în special pentru situațiile de vehicule mixte conduse de om și autopropulsate.

Prof. Rus și studenții săi au adus contribuții semnificative și remarcabile. Ei au dezvoltat o nouă formulare matematică a autonomiei paralele ca o abordare de control partajată între oameni și vehicule inteligente, care aderă la principiul intervenției minime și este capabilă să gestioneze scenarii complexe de conducere. Controlul pentru autonomie paralelă este un control predictiv de model neliniar (NMPC) în timp real, potrivit pentru generarea traiectoriei în vehicule inteligente și autonome, care se bazează pe un rezolvitor de ultimă generație.

Ei au dezvoltat, de asemenea, o formulare nouă și creativă de control și coordonare în sisteme mixte de vehicule conduse de oameni și auto-conduse, care utilizează orientarea valorii sociale, care cuantifică modul în care oamenii negociază, pentru a estima personalitatea șoferilor și pentru a calcula un răspuns sigur utilizând un multiplu asimetric-joc agent Stackelberg. În plus, au dezvoltat recent planificatoare informative pentru sisteme multi-agenți care sunt robuste în condiții de incertitudine și combină comportamentul de căutare a informațiilor cu raționamentul teoretic al jocului. Soluția se bazează pe o metodă de calcul a echilibrului Nash pentru jocurile dinamice în spațiul considerat. Soluția dă, de asemenea, o lege de feedback liniară, similară cu controlul liniar-quadratic-gaussian (LQG).

Lucrări mai recente iau în considerare învățarea de la un capăt la altul de la oameni cum să conducă. Această lucrare observă că o provocare cu accent actual asupra abordărilor de învățare profundă este că modelele învățate tind să fie cutii negre uriașe, de exemplu modelul pentru conducere include peste 100.000 de neuroni și peste jumătate de milion de parametri. Deși aceste sisteme obțin performanțe bune, harta atenției acestor sisteme tinde să fie cu mult zgomot. În total, acestea sunt provocări semnificative pentru aplicațiile critice pentru siguranță, cum ar fi conducerea. Într-o lucrare Nature Machine Intelligence din 2020, prof. Daniela Rus și colaboratorii introduc o nouă idee pentru învățarea automată, care este potrivită pentru aplicații critice pentru siguranță, cum ar fi autonomia: Neural Circuit Policies (NCP) în care neuronii sunt ecuații diferențiale specializate cu timp fluid. NCP-urile oferă o reprezentare compactă de mișcare în comparație cu rețelele neuronale profunde (DNN); de exemplu, sarcina de învățare a conducerii de la capăt la capăt care necesită peste 100.000 de neuroni DNN poate fi realizată cu 19 neuroni NCP, oferind o soluție interpretabilă. Abordarea a fost demonstrată pentru o varietate de sarcini de mobilitate la sol și în aer.

În prezent, cercetarea prof. Daniela Rus are 57527 de citări în Google Scholar cu un factor h de 126 și un indice i10 de 524. Lucrările sale au fost publicate în cele mai importante conferințe și reviste de robotică, învățare automată și inteligență artificială și de asemenea, în reviste de mare impact, inclusiv Science, Nature și Proceedings of the National Academy of Engineering (PNAS). Prof. Rus este membru al IEEE, ACM și AAAI. Dânsa este și fellow a fundației MacArthur. Munca sa a fost recunoscută cu mai multe premii importante: calitatea de membru al Academiei Naționale de Inginerie și Academiei Americane de Arte și Știință, Premiul Engelberger pentru Robotică, premiul de pionier IEEE RAS, premiile IJCAI John McCarthy și câteva premii pentru cea mai bună lucrare, printre altele.

Contribuțiile de conducere ale prof. Rus includ conducerea în domeniul Științei Calculatoarelor și Inteligenței Artificiale (CSAIL) din 2012, susținând cu fermitate educația timpurie în gândirea computațională, înființarea TEDxMIT cu evenimentul inaugural desfășurat în 2019 și axat pe femei în IT și al doilea eveniment axat pe calcul în sprijinul combaterii schimbărilor climatice, înființarea și găzduirea, printre altele, a MIT AI și a simpozionului Future of Work din 2017. Ea a contribuit la comunitatea roboticii, ajutând la organizarea a numeroase conferințe, ajutând la identificarea conducerii pentru NSF și participând activ la evenimente care aduc publicului progresele roboticii.

Senatul Universității Tehnice din Cluj-Napoca a concluzionat că profesorul dr. Daniela Rus este o personalitate marcantă a comunității științifice internaționale, cu contribuții semnificative în domeniul roboticii și inteligenței artificiale.

Pentru viitor ne propunem ca, prin amabila facilitare a profesorului Daniela Rus, universitatea noastră să intensifice colaborarea cu MIT în domeniul roboticii și inteligenței artificiale și să valorifice oportunități în programele de cercetare și schimburile de studenți și personal academic între universitățile noastre.

De asemenea, aş dori să subliniez faptul că, prin funcțiile și capitalul social dezvoltat de-a lungul carierei profesionale, profesorul Daniela Rus are potențialul de a contribui în mod major la integrarea Universității Tehnice din Cluj-Napoca în proiecte și programe la scară internațională cu companii și alte universități din întreaga lume.

Acestea sunt, onorabilă audiență, doar câteva argumente pentru care, Senatul Universității Tehnice din Cluj-Napoca, a votat în unanimitate acordarea celei mai înalte distincții academice de Doctor Honoris Causa doamnei profesor dr. Daniela Rus.

O salut pe profesorul Daniela Rus cu profund respect și mare satisfacție pentru acest premiu, văzând în acest titlu un semn și o dovadă a dorinței noastre de a consolida și spori în viitor colaborarea științifică și profesională bilaterală dintre Universitatea Tehnică din Cluj-Napoca și MIT, SUA.

Profesor Dr. Stelian Brad,
Universitatea Tehnică din Cluj-Napoca

Technical University of Cluj-Napoca
Cluj-Napoca, October 18, 2022

LAUDATIO

In honour of Mrs. Professor Dr. Daniela Rus
from the Massachusetts Institute of Technology
on the occasion of awarding the title of

Doctor Honoris Causa

of the Technical University of Cluj-Napoca, Romania

Dear Mr. Rector of the Technical University of Cluj-Napoca
Professor Vasile Țopa,
Dear Mr. President of the Senate Professor Nicolae Burnete,
Dear Mr. Vice-president of the Senate Professor Vasile Dădârlat,
Dear Members of the Senate,
Dear guests,
Dear colleagues,
Dear Ladies and Gentlemen,

The Technical University of Cluj-Napoca has today the pleasure to bring a deep respect to Mrs. Daniela Rus, professor at the Massachusetts Institute of Technology from USA, remarkable scientific and academic personality in robotics and artificial intelligence.

I am honoured that, on behalf of the academic community of the Technical University of Cluj-Napoca, to present in front of you the most significant results of the impressive professional and scientific career that characterise the complex personality of Professor Daniela Rus.

I acknowledge from the very beginning that I had a highly responsible task to synthesise in a few sentences the achievements of the outstanding personality embodied by Professor Daniela Rus. Nevertheless, it was a very honourable mission that I have accomplished with the greatest pleasure.

About the complex and laborious activity of Professor Daniela Rus, with exceptional results in knowledge creation and practice in robotics and AI, I could say a lot of words. However, this festive event puts me in the situation to summarise his outstanding professional achievements to some representative milestones.

Daniela Rus is Professor of Electrical and Computer Engineering at MIT, USA and Director of MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL). He is associate dean of research for the Schwarzman College of Computing at MIT.

The focus of Daniela Rus's research is to develop the science and engineering of autonomy, especially when groups of robots interact with each other and with people toward the long-term objective of enabling a future with machines pervasively integrated into the fabric of life, supporting people with cognitive and physical tasks. Her research addresses some of the gaps between where agents, whether embodied or not, are today, and the promise of pervasive agents: increasing the ability of machines to reason, learn, and adapt to complex tasks in human-centered environments, developing intuitive interfaces between robots and people, and creating the tools for designing and fabricating new robots quickly and efficiently. The applications of this work are broad and include demonstrations in transportation, manufacturing, agriculture, construction, underwater exploration, smart cities, medicine, monitoring, and in-home tasks such as cooking.

Her research answers the questions: how can we build machines with desired function faster? How can we build autonomous machines with increasingly more complex capabilities, and how can many machines collaborate to achieve a common goal? For each of these questions, an important objective is for the system as a whole to have guaranteed behavior. Distributed robotics is an important area of robotics as it addresses how collections of robots can collaborate to achieve a larger task than each individual robot is capable of doing. Her research addresses the development of algorithms that enable design and fabrication, autonomous control, and collaboration.

She further demonstrated an important extension of the ideas in distributed robotics to distributed sensing and sensor networks. There had been work previously in geometry, or in systems; her work addresses building and understanding robust systems combining these considerations.

An important theme in this work is self-organization: the study of computational processes that interact with each other and with the physical world by means of perception, communication, and change to achieve system reconfiguration in response to the task requirements and the environment.

Prof. Daniela Rus and her students have contributed seminal results to robot design and control for multi-robot systems and for soft robot systems. Prof. Daniela Rus's research includes three key components:

• designing and building novel autonomous machines capable of ever increasingly more complex tasks without human supervision, including some of the first autonomous soft robots and self-organizing modular robot systems; these systems with diverse novel shapes and built of a wide variety of materials expand our range of robots

• developing algorithms for these new machines and analyzing the physical capabilities of these machines;

• developing deployable machine learning algorithms focused on scalability, performance, robustness, and ability to connect reasoning to control; and

• applying the new capabilities to problems in transportation, manufacturing, agriculture, and everyday life.

Prof. Daniela Rus's research approaches the study of the science and engineering of autonomy as integrated hardware-software, or body-brain systems. She sees the body of the robot as critical in defining the range of capabilities of the robot, and the brain critical in enabling the body to deliver on its capabilities. To this end, she developed a range of algorithms for computation design and fabrication of robots.

Her work on the development of the Robot Compiler introduces a computational approach to designing the mechanical robot body (for folded robot systems), its electronic substrate, and its low-level control infrastructure from high level specifications won the best paper award at IROS 2014.

Her work on novel robot designs has contributed several novel robot platforms with novel capabilities, AMOUR, the hovering underwater robot, Miche and Pebbles, modular robots that achieve desired shapes by self-dissasembly, M-Blocks, the self-organizing modular robot system, SoFi, the soft robot fish, Roboats, a modular rectangular robotic boats, the Origami Magic Ball gripper, the soft-strong robot gripper that uses a novel fluid-driven artificial muscle capable of lifting up to 1000x its weight, and the MiniSurgeon Robot Pill, an origami system made of sausage casing designed for incision-free surgery among many others. Prof. Daniela Rus's work on robot design expands our notion of robot bodies, by introducing a range of new shapes and materials for creating robots.

An important theme in this work is self-organization: the study of computational processes that interact with each other and with the physical world by means of perception, communication, and change to achieve system reconfiguration in response to the task requirements and the environment.
Prof. Daniela Rus and her students have contributed seminal results to robot design and control for multi-robot systems and for soft robot systems. Prof. Daniela Rus's research includes three key components:

Prof. Daniela Rus has contributed some of the first multi robot systems algorithms with performance guarantees in distributed robotics by introducing a control-theoretic optimization approach for adaptive decentralized coordination. Key to these results is the tight coupling between perception, control, and communication. The control algorithms are decentralized, adaptive, and provably stable. They have been fielded on teams of robots and sensor nodes on the ground, in the air, and in water. Prof. Daniela Rus was the first to provide a real-time solution to adaptive distributed coverage with a team of autonomous robots capable of communicating to neighbors, when the sensory function is unknown. This algorithm is the basis of a general approach to decentralized control for teams of robots whose goal can be formulated as a particular type of cost function. The approach has been used for adaptive coverage, exploration, and assembly. The results have been extended with appropriate perception and communication models for underwater and aerial vehicles and demonstrated in field experiments. Professor Rus's seminal work in network control has bridged between the robotics community and the sensor network community. More specifically, Prof. Daniela Rus's work provided a rigorous approach to synthesizing adaptive decentralized controllers that are provably stable and convergent and enable a range of collective robot capabilities such as adaptive sampling and exploration, formation control that is adaptive to dynamic obstacles, collaborative assembly, distributed map making, and socially optimal transportation systems among others.

These problems were formulated as optimization with a cost function and consensus and the modeling and analyses guarantee that the systems achieve real-time convergence by using consensus.

Prof. Daniela Rus has also contributed to the development of the field of modular robot systems by developing the early algorithms for self-reconfiguration planning for modular robots.

She explored several modalities of self-reconfiguration. In one body of work reconfiguration is accomplished when individual modules travel on the surface of the aggregate structure according to reconfiguration plans that compute the sequence of moves for each module.

Another body of work examines reconfiguration by traveling through the volume of the structure using actuation by scaling. A third body of work examines self-reconfiguration by self-disassembly. In each of these works, the contributions include planning algorithms and designs and physical platforms that demonstrate new capabilities. The early work examined modular robot systems capable of traveling on the surface of the structure.

Prof. Daniela Rus has been a pioneer in developing the field of soft robotics. Her work addresses design, fabrication, and control of soft robots. Her work with her students introduced the first self-contained and deployable autonomous robot systems – in the form of soft robot fish, soft robot hands, and soft robot manipulators. Soft robotics is a very important and rapidly growing area of robotics, which has the potential of ushering in an era of safe robots for human-centered environments.

Traditional robots are often too rigid for human-centered environments where the tasks are unpredictable, and the robots have to ensure that their interaction with the environment and with humans is safe. Today's industrial manipulators enable rapid and precise assembly, but these robots are isolated from humans on the factory floor because they are dangerous to be around.

In contrast, soft robots have bodies made out of intrinsically soft and/or extensible materials (e.g., silicone rubbers or fabrics) and are safe to be around. They have a continuously deformable structure with muscle-like actuation that emulates biological systems and provides them with a relatively large degrees of freedom. A robot which can deform its body continuously is able to envelop an object and build up a surface contact, unlike a rigid-bodied robot which is only able to make discrete contact with the object while enveloping it. The soft robot control challenge is very complex on both a theoretical and technological level. Prof. Daniela Rus and her students and collaborators provide the first solutions for controlling soft robot limbs with theoretical foundations and validity in practice.

Combining a sound theoretical point of view, with the ability of applying his theories in the practice, this work was the first demonstrated execution of precise and fast motions with soft bodied robots. These results contributed new systems capable of reliable and controlled interaction with an unstructured environment -- a fundamentally important task when considering that soft robots are made for work in unstructured situations, and for interaction with the environment.

These technical ideas have resulted in several novel devices, including the soft robotic fish SoFi which swam autonomously in natural coral reef environments (Science Robotics 2018), Origami Magic Ball Gripper a strong soft gripper capable of lifting 100x its weight (ICRA 2019), a meter-scale modular soft robotic system capable of legged locomotion and pick-and-place (Soft Robotics 2021), soft robotic modules with skin (RoboSoft 2021), handed shearing auxetic soft grippers that are electrically driven (Science 2018, RoboSoft 2018), JelloCube, a soft cube robot capable of continuous jumping (IEEE Transactions on Mechatronics 2019).

Prof. Daniela Rus is also considering the long-term operation of machines by focusing on learning robustly, and scalably complex tasks. For example, AAAI 2020 paper introduces a method to learn finite state machines that represent policies from expert behavior that are interpretable and manipulable by using a deep Bayesian nonparametric hierarchical model. Interpretability is achieved by modeling the interactions between high-level actions as an automaton with connections to formal logic. Manipulability is achieved by integrating this automaton into planning, so that changes to the automaton have predictable effects on the learned behavior. Recent results on robustness and scalability are addressed in her ICLR 2019 and ICLR 2020 papers addressing compression and pruning that achieve very large reduction in parameters (over 90% for standardized tests) with guarantees. Her body of work on end-to-end learning include learning from humans how to drive (best paper finalist at ICRA 2019) and developing phostorealistic simulators that support sim-to-real control and the generation of corner cases for autonomous driving.

In addition to contributing fundamentally to the design, control, planning, and learning for agents, Prof. Daniela Rus also considered what is necessary for robots to be deployed in the world. One example is her project to develop self-driving vehicles. Her work resulted in the development and deployment of 9 autonomous vehicles including a Toyota Prius car, a Mitsubishi iMiev car, several golf carts, and several autonomous wheelchairs. The self-driving control aspect of this work focuses on developing new planning, control, and machine learning algorithms for autonomous systems such as cars. This work aims to increase the decision-making capabilities of autonomous vehicles, especially for situations of mixed human-driven and self-driven vehicles. Prof. Rus and her students have made significant and outstanding contributions.

They developed a novel mathematical formulation of Parallel Autonomy as a shared control approach between humans and intelligent vehicles, which adheres to the minimal intervention principle and is able to handle complex driving scenarios.

The control for parallel autonomy is a real-time Non-linear Model-Predictive Control (NMPC) suitable for trajectory generation in intelligent and autonomous vehicles, which relies on a state-of-the-art solver.

They also developed a novel and creative formulation of control and coordination in mixed human-driven and self-driving vehicle systems that uses Social Value Orientation, which quantifies how humans negotiate, to estimate the personality of drivers and compute a safe response using an asymmetric multi-agent Stackelberg game. Additionally, they recently developed informative planners for multi-agent systems that are robust under uncertainty and combine information-seeking behavior with game theoretic reasoning.

The solution rests on a method for computing Nash equilibria for dynamic games in belief space. The solution also yields a linear feedback law, similar to Linear-Quadratic-Gaussian (LQG) control. More recent work considers end-to-end learning from humans how to drive.

This work observes that a challenge with the current focus on deep learning approaches is that the learned models tend to be huge black boxes, for example the model for driving includes over 100,000 neurons and over half a million parameters. Although these systems achieves good performance, the attention map of these systems tends to be noisy.

Altogether these are significant challenges for safety-critical applications such as driving. In a 2020 Nature Machine Intelligence paper, Prof. Daniela Rus and collaborators introduce a new idea for machine learning that is well suited for safety-critical applications such as autonomy: Neural Circuit Policies (NCP) where neurons are specialized differential equations with liquid time. NCPs provide a move compact representation as compared to deep neural networks (DNN); for example the end-to-end learning to drive task that requires 100,000+ DNN neurons can be achieved with 19 NCP neurons, providing an interpretable solution. The approach has been demonstrated for a variety of mobility tasks on the ground and in the air.

As of today, Prof. Daniela Rus's research has 57527 citations in google scholar with an h-factor of 126 and an i10-index of 524. Her work has been published in the top robotics, machine learning, and AI conferences and journals, and also in high impact journals including Science, Nature and the Proceedings of the National Academy of Engineering (PNAS). Rus is fellow of IEEE, ACM, and AAAI. She is a MacArthur fellow. Her work has been recognized with several important awards: membership in the National Academy of Engineering and the American Academy of Arts and Science, the Engelberger Award for Robotics, the IEEE RAS pioneer award, IJCAI John McCarthy awars, and several best paper awards among others.

Rus's leadership contributions include leading the Computer Science and Artificial Intelligence (CSAIL) since 2012, strongly advocating for early education in computational thinking, founding TEDxMIT with the inaugural event held in 2019 and focused on women in computing and the second event focused on computing in support of combating climate change, founding and hosting the MIT AI and the Future of Work symposium since 2017 among others.

She has contributed to the robotics community by helping with the organization of numerous conferences, helping to identify leadership for the NSF, and actively participating in events that bring the advancements of robotics to the public.

The Senate of the Technical University of Cluj-Napoca has concluded that Professor Dr. Daniela Rus is a prominent personality of the international scientific community, with significant contributions in the field of robotics and artificial intelligence.

For the future we envisage that, through the kind facilitation of Professor Daniela Rus, our university will enhance the collaboration with MIT in the field of robotics and artificial intelligence and will valorise opportunities in research programs and exchanges of students and academic staff between our universities.

I would also like to highlight the fact that, through her positions and social capital developed along the professional career, Professor Daniela Rus has the potential to contribute in a major way at the integration of the Technical University of Cluj-Napoca in projects and programs of international scale with companies and other universities worldwide.

These are, dear and honourable audience, only a few arguments for which, the Senate of the Technical University of Cluj-Napoca, voted in unanimity to award the highest academic distinction of Doctor Honoris Causa to Mrs. Professor Dr. Daniela Rus.

I salute Professor Daniela Rus with profound respect and great satisfaction for this award, seeing in this title a mark and evidence of our wish to strengthen and enhance in the future the bilateral scientific and professional collaboration between Technical University of Cluj-Napoca and MIT, USA.

Professor Dr. Stelian Brad,
Technical University of Cluj-Napoca

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Daniela Rus
Department of Electrical Engineering and Computer Science
Web Site: DanielaRus.com

Education:

School	Degree	Date
University of Iowa	BS	1985
Cornell University	MS	1990
Cornell University	PhD	1992

Title of Thesis for Most Advanced Degree:
"Fine motion planning for dexterous manipulation."

Principal Fields of Interest:
Robotics; Artificial Intelligence; Machine Learning; Computer Science

History of MIT Appointments:

Rank	Beginning	Ending
Associate Professor (with tenure)	Jan 2004	July 2006
Professor	July 2006	present
Director, CSAIL	2012	present
Andrew (1056) and Erna Viterbi Professor	2013	present
Deputy Dean of Research, Schwarzman College of Computing	2019	present

In the matrixed organization of MIT, with departments responsible for teaching and research units responsible for research, CSAIL is the largest research unit with over 1300 members, including 125 PIs, 500+ PhD students, 100+ MENG students, 360+ undergraduate researchers, 100 postdocs, and 90 staff members supporting the lab with administrative, fiscal, HR, infrastructure, communications, and development functions, and a yearly budget of $90M. The CSAIL director is responsible for all operations and activities of CSAIL. Specifically, as CSAIL Director I:

* Developed CSAIL vision and intellectual strategy;

* Created and implemented fund raising strategy for the lab with research and operational components;

* Created advancement opportunities and programs for the faculty, students, and staff;

* Developed and implemented the CSAIL branding and communication strategy;

* Represented and promoted the CSAIL community externally;

* Created programs aimed at raising the CSAIL profile nationally and internationally;

* Developed CSAIL Leadership structure and organize the enterprise services;

* Developed and implemented processes and policies for the enterprise services (including fiscal, HR, communications, infrastructure, and resource development;

* Developed and implemented processes for promotions of staff, including non-tenure track PIs; responsible for the promotion of principal research scientists

* Developed and implemented strategy for mentorship and community building, creates positive culture, inclusivity and diversity, and a sense of belonging across all members of the lab;

* Created a series of online courses for professional education taken by 30,000+ students from 153 countries;

* Created and delivered a 3-day in-person program on AI for National Security Leaders;

* Created a new blended major called Computational Urban Studies across two departments (EECS and Urban Studies)

* Developed collaborative projects at the intersection of engineering and art and engineering and social sciences

In my tenure as CSAIL director CSAIL has enjoyed nearly 100% growth in research volume (from $45mil to $90+mil now) and 50% growth in membership. I have raised over $250M for research and operations. CSAIL is self-funded, with an annual operations budget of $9mil (raised annually.) I have built the CSAIL Alliances Program, whose net annual discretionary revenue from corporates is approximately $7mil/year.

In my tenure as Deputy Dean of Research, I coordinated the research units in the Schwarzman college of computing and collaborated across MIT on several initiatives. I have raised over 100M in research funds for the faculty in the College, including creating and leading the AI Accelerator Program with $77M in funding from the Department of the Air Force. I have developed Hot Topics in Computing, a thought-leadership series, along with several symposia on: AI and the Work of the Future, AI and Medicine, and AI and Climate.

Professional Experience

Employer	Position	Beginning	Ending
Dartmouth College	Asst, Assoc, Full Prof.	1994	2004
Mass Robotics	Board of Directors	2015	present
Toyota Research Institute	Technical Adv. Board	2016	2019
Defense Innovation Board	Member	2018	2021
Defense Science Board	Member	2022	present
PCAST	Member	2020	2021
(PCAST is USA President's Council of Advisors for Science and Technology)			
Hyundai Motor Company	Technical Adv. Board	2019	present
MBZUAI (new AI Univ.)	Board of Trustees	2019	present
MBZUAI	Chair, Auditing Comm.	2020	present
The Mitre Corporation	Senior Visiting Fellow	2019	present
British Telecom	Technical Adv. Board	2021	present
RoboGlobal	Technical Adv. Board	2019	present
Vecna Robotics	Board of Directors	2020	present
Ava Robotics	Board of Directors	2020	present
Accenture	Luminary	2017	present
Venti Technologies	Founder, Adv. Board	2017	present
The Routing Company	Founder, Adv. Board	2019	present
The Routing Company	Board of Directors	2019	2021
Singapore's Research, Innovation, and Enterprise Council (reporting to Singapore Prime Minister)		2022	present
Global Partnerships in AI (US expert representative)		2020	present

In my role on the Board of Trustees of MBZUAI, I helped identify leadership (president and provost), I contributed to creation of the academic structure of the university, the operating structures and principles, as well as the vision and the initiatives of the university. As chair of the auditing committee, I helped develop the auditing and compliance processes of the university.

Select Other Professional Activities:

Activity	Beginning	Ending
Computing Community Council (CCC)	2013	2016
UN Commissioner: Pathways to Prosperity Commission	2018	2019
Piaggio Fast Forward, Tech. Adv. Board	2018	2019
Comp. Sci. and Telecomm. Board (CSTB)	2016	present

Scientific American, Board of Advisors	2018	present
Forbes, AI Executive Board of Advisors	2018	present
ACM Fellow Selection Committee	2019	present
NAE Section 5 Peer Committee	2021	present
zipML, Themis, Co-Founder	2021	present
Knowledge AI, Gavilan, Venti, RIIID Tech. adv. Boards		
Leadership selection committee several times for NSF CISE and NSF-IIS		

Select Research Initiatives Launched as CSAIL Director, SCC Deputy Dean, and Mass Robotics Board Member

AI Accelerator	2019	present
VisualComputing@CSAIL	2022	(launching)
ComputingSustainability@CSAIL	2023	(developing)
DataGovernance@CSAIL	2020	present
MachineLearningApplications@CSAIL	2020	present
TrustworthyAI@CSAIL	2018	present
FinTech@CSAIL	2018	present
SystemsThatLearn@CSAIL	2017	present
METEOR Diversity Postdoctoral Program	2021	present
TEDxMIT Great Women of MIT	2019	2019
TEDxMIT Operation Earth	2019	2019
TEDxMIT Tech Superpowers	2022	2022
BigData@CSAIL	2012	2017
Cybersecurity@CSAIL	2015	2020
CSAIL Communities of Research	2020	present
CSAIL Communities of Practice	2022	present
AI for Senior National Security Leaders	2021	present
Robotics Medal for Female Researcher (MassRobotics)	2022	present

Select Awards Received:

Award	Date
IEEE Robotics and Automation Technical Award	2023
MIT Outstanding Event: TEDxMIT	2022
AI 2050 Fellow, Schmidt Futures	2022
Boston Globe Tech Power Players 50	2022
Doctor Honoris Causa, Technical University Cluj-Napoca	2022
HPC Innovation Excellence Award	2022

Top 10 Women in AI (2), Top 100 Women in Tech (16)	2021
Top 10 World's Most Influential Women Engineers	2021
Member of the American Academy of Arts and Sciences	2017
Member of the National Academy of Engineering	2015
Fellow of ACM	2015
Fellow of IEEE	2009
Fellow of AAAI	2009
MacArthur Fellow	2002
Mass TLC Innovation Catalyst Award	2019
IJCAI John McCarthy Award	2020
Engelberger Robotics Award	2017
IEEE Robotics and Automation Pioneer Award	2018
Constellation's Business Transformation 150 (BT150)	2018
Boston Business Journal Women of Influence	2015
Best Robot Actor at Robot Film Festival (Seraph)	2012
Member, Massachusetts Women's Forum	2013

Publications Indices:
Google Scholar Citations: 57527
H-index: 126
I10-index: 524
https://scholar.google.com/citations?hl=en&user=910z20QAAAAJ

Recent AI, Robotics, and Machine Learning Publications – available upon request

References – available upon request

LISTA PUBLICAȚIILOR
Prof. Daniela Rus

Lucrări în reviste

Mathias Lechner, Ramin Hasani, Alexander Amini, Thomas A. Henzinger, Daniela Rus, Radu Grosu, "Neural circuit policies enabling auditable autonomy" Nature Machine Intelligence: volume 2, pages 642–652, 13 October 2020.

Daniela Rus, Andrew Spielberg, Josie Hughes, Mark Chounlakone, Gloria Chang, Wojciech Matusik, "A Simple, Inexpensive, Wearable Glove With Hybrid Resistive-Pressure Sensors For Computational Sensing, Proprioception, And Task Identification" Advanced Intelligent Systems, 3 June 2020.

Kirstin H. Petersen, Nils Napp, Robert Stuart-Smith, Daniela Rus and Mirko Kovac, "A review of collective robotic construction" Science Robotics 13 Mar 2019: Vol. 4, Issue 28, eau 8479.

Rus, Daniela and Michael T. Tolley, "Design, fabrication and control of origami robots" Nature Review Mater. 3, 101-112, June 2018.

Seyhyuk Yim, Cynthia Sung, Shuhei Miyashita, Daniela Rus and Sangbae Kim, "Animatronic soft robots by additive folding" International Journal of Robotics Research, 5 June 2018.

Jeffrey Lipton, Robert MacCurdy, Zachary Manchester, Lillian Chin, Daniel Cellucci, and Daniela Rus, "Handedness in shearing auxetics creates rigid and compliant structures" Science, 11 May 2018.

Robert K. Katzschmann, Joseph DelPreto, Robert MacCurdy, Daniela Rus, "Exploration of underwater life with an acoustically controlled soft robotic fish" Science Robotics, 14 March 2018.

Shuguang Li, Daniel M. Vogt, Daniela Rus, and Robert J. Wood, "Fluid-driven origami-inspired artificial muscles" PNAS, November 2017.

Daniela Rus, “AI, a Vector for Positive Change”, Expert Forum, Artificial Intelligence Index, 2017 Annual Report. November 2017, pp 56-58.

Shuhei Miyashita, Steven Guitron, Shuguang Li, and Daniela Rus, “Robotic Metamorphosis by Origami Exoskeletons”, Science Robotics. 27 Sep 2017: Vol. 2, Issue 10.

Adriana Schulz, Cynthia Sung, Andrew Spielberg, Wei Zhaom, Yu Cheng, Eitan Grinspun, Daniela Rus, Wojciech Matusik, “Interactive Robogami: An End-to-End System for Design of Robots with Ground Locomotion” International Journal of Robotics Research, August 2017.

J. Lipton, A. Fay, D. Rus, “Baxter’s Homunculus: Virtual Reality Spaces for Teleoperation in Manufacturing” IEEE Robotics and Automation Letters (RA-L), July 2017.

Dan Feldman, Chongyuan Xiang, and Daniela Rus “Coresets for Differentially Private k-Means Clustering and Applications to Privacy in Mobile Sensor Networks” 2016 ACM Conference on Embedded Sensor Networks (Sensys), April 2017.

Scott Drew Pendleton, Hans Andersen, Xinxin Du, Xiaotong Shen, Malika Meghjani, You Hong Eng, Daniela Rus, and Marcelo H. Ang Jr., “Perception, Planning, Control, and Coordination for Autonomous Vehicles, Machines” 5 (6), 17 February 2017.

Javier Alonso-Mora, Samitha Samaranayake, Alexander Wallar, Emilio Frazzoli, Daniela Rus “On-demand high-capacity ride-sharing via dynamic trip-vehicle assignment” Proceedings of the National Academy of Science, vol. 114, no. 3, pp 462—467, January 2017.

Jingjin Yu, Mac Schwager, Daniela Rus, “Correlated Orienteering Problem and Its Applications to Persistence Surveillance”, Transactions on Robotics, vol 32, no 5, pp 1106 – 1118, 2016.

Andrew Marchese, Russ Tedrake, and Daniela Rus, “Dynamics and Trajectory Optimization for a Soft Spatial Fluidic Elastomer Manipulator”, Vol 35, No 7, pp 840-869, The International Journal of Robotics Research (IJRR) 2016.

Mac Schwager, Michael Vitus, Samatha Powers, Daniela Rus, Claire Tomlin, "Robust Adaptive Coverage Control for Robotic Sensor Networks", in IEEE Transactions on Control of Networked Systems, accepted in June 2015.

Cynthia Sung, Dan Feldman, Andrew Sugaya, and Daniela Rus, "iDiary: from GPS signals to text-searchable diaries", accepted by the ACM Transactions on Sensor Networks, June 2015.

Daniela Rus and Michael Tolley, "Design, Fabrication, and Control of Soft Robots" Nature 521, pp 467-475, May 2015.

Mehmet Dogar, Ross Knepper, Andrew Spielberg, Changhyun Choi, Henrik Christensen, Daniela Rus, Multi-scale Assembly with Robot Teams, accepted, the International Journal of Robotics Research, April 2015.

Ross Knepper, Stefanie Tellex, Adrian Li, Nickolas Roy, Daniela Rus, "Recovering from Failure by Asking for Help", accepted Autonomous Robotics, June 2015.

Jingjin Yu, Sertac Karaman, Daniela Rus, "Correlated Orienteering Problem and Its Applications to Persistence Surveillance", submitted to Transactions on Robotics, December 2014.

Ross Knepper and Daniela Rus, "A Safe, Scalable, Distributed Approach to Pedestrian Robotics Navigation", submitted to the IEEE Transactions on Automation Science and Engineering, November 2014.

JingJin Yu, Sertac Karaman, Daniela Rus, "Persistent Monitoring of Events with Stochastic Arrivals at Multiple Stations", submitted to Transactions on Robotics, September 2014.

Andrew Marchese and Daniela Rus, "Design, Kinematics, and Control of a Soft Spatial Fluidic Elastomer Manipulator", accepted the International Journal of Robotics Research, April 2015.

Daniela Rus and Michael Tolley, "Soft: A New Paradigm in Robotics", Nature 521, pp 467-475, May 2015.

Ryuma Niiama, Byoung An, Xu Sun, Cynthis Sung, Sangbae Kim, Daniela Rus, "Pouch Motors: Printable Soft Actuators Integratable with Computational Design", Soft Robotics, accepted in February 2015.

Ankur Mehta, Joseph DelPreto, Daniela Rus, "Integrated codesign of print and fold robots", Journal of Mechanisms and Robotics, 7(2) 2015, doi:10.1115/1.4029496.

Cynthia Sung and Daniela Rus, "Foldable Joints for Foldable Robots", Journal of Mechanisms and Robotics, 7(2) 2015, doi:10.1115/1.4029490.

Shuhei Miyashita, Isabella DiDio, Ishwarya Ananthabhotla, Byoungkwon An, Cynthia Sung, Slava Arabagi, Daniela Rus, " "Folding Angle Control by Designing a Curved Crease for Self-Assembling Origami Propellers", Journal of Mechanisms and Robotics, 7(2) 2015, doi:10.1115/1.4029548.

Stephanie Gil, Swarun Kumar, Dina Katabi, Daniela Rus, "Adaptive Communication in Multi-Robot Systems using Directionality of Signal Strength", the International Journal of Robotics Research, vol 34, no 7, June 2015.

Andrew Marchese, Russ Tedrake, and Daniela Rus, "Dynamics and Trajectory Optimization for a Soft Spatial Fluidic Elastomer Manipulator", accepted by the international Journal of Robotics Research, IJRR, April 2015.

Andrew Marchese, Robert Katzschmann, Daniela Rus, "A Recipe for Designing and Fabricating Soft Robots", Soft Robotics, Volume 2, Issue 1, pp 7-25, March 2015.

Sam. Felton, Mike Tolley, Erik Demaine, Daniela Rus, Rob Wood, "A method for building Self-Folded Machines", Science, Vol 345, pp 644-646, 2014.

Carrick Detweiler, Sreeja Banerjee, Marek Doniec, Mingshun Jiang, Francesco Peri, Robert Chen, Daniela Rus, "Adaptive Decentralized Control of Mobile Underwater Sensor Networks and Robots for Modeling Underwater Phenomena", Journal of Sensor and Actuator Networks, 3(2):113-149, 2014.**

Shuhei Miyashita, Laura Meeker, Mike Tolley, Rob Wood, Daniela Rus, "Self-Folding Miniature Elastic Devices", Smart Materials Structure 23, 2014.

Tolley, D. Aukes, S. Felton, S. Miyashita, R. Rus, R. Wood, “Self-folded Origami: Shape Memory Composites Activated by Uniform Heating”, accepted, Smart Materials Structure 23, 2014.

Marchese, C. Onal, D. Rus, “Autonomous Soft Robotic Fish Capable of Escape Maneuvers using Fluidic Elastomer Actuation”, Soft Robotics Vol. 1, No. 1, pp 75-87, March 2014.

Basha, R. Jurdak, and D. Rus “In-network Distributed Solar Current Prediction”, accepted, ACM Transactions on Sensor Networks, March 2014.

Sung, E. Demaine, M. Demaine, D. Rus, “Edge Compositions of 3D surfaces”, Journal of Mechanical Design, 2013.

Julian, S. Karaman, and D. Rus, “On mutual information-based control of range sensing robots for mapping applications”, 33(10):1375-1392, International Journal of Robotics Research, 2014.

Xu Chu (Dennis) Ding, Steven Smith, Calin Belta, Daniela Rus, Optimal Control of Markov Decision Processes with Temporal Logic, accepted, IEEE Transactions on Automatic Control, accepted, to appear June 2014.

Soltero, M. Schwager, and D. Rus, “Decentralized path planning for coverage tasks using gradient descent adaptive control”, International Journal of Robotics Research, March, 2014, vol. 33, no. 3, pp. 401-425.

SK Yun and D. Rus “Adaptive Coordinated Construction of Truss Structures Using Equal Mass Partitioning”, IEEE Transactions on Robotics, Vol 30, no 1, pp 188-202, Feb 2014.

Lim and D. Rus, “Congestion-aware Multi-agent Path Planning: Distributed Algorithms and Applications” The Computer Journal, Oxford University Press, available online in July 2013.

An and D. Rus, “Designing and Programming Self-Folding Sheets” , Robotics and Autonomous Systems, accepted, August 2013.

Marek Doniec, Michael Angermann, Daniela Rus, “An End-to-End Signal Strength Model for Optical Underwater Communication”, IEEE Journal of Ocean Engineering, Vol 38, no 4, pp 743-757, October 2013.

Ulusoy, D. Ding, S. Smith, C. Belta, D. Rus., “Optimality and Robustness in Multi-Robot Path Planning with Temporal Logic Constraints”, International Journal of Robotics Research, 32(8) 889-911, 2013.

Onal, D. Rus, and R. Wood, “An origami-inspired approach to worm robots”, accepted, IEEE Transactions on Mechatronics, Vol. 18, no. 2, pp 430-438, March 2013.

Bruce Donald, Chris Levey, Igor Paprotny, and Daniela Rus, Planning and control for microassembly using stress-engineered MEMS microrobots, International Journal of Robotics Research 32(2):218-246, 2013.

Ok, C. Onal, S. Kim, D. Rus, and R. Wood, “Meshworm: a peristaltic soft robot with antagonistic nickel titanium coil actuators”, 99:1-13, IEEE Transactions on Mechatronics, 2012.

Julian, M. Angermann, M. Schwager and D. Rus, “Distributed Robotic Sensor Networks: An Information Theoretic Approach,” International Journal of Robotics Research, 31(10) 1134-1154, 2012.

Pavone, S. L. Smith, E. Frazzoli, and D. Rus. Robotic Load Balancing for Mobility-on-Demand Systems. International Journal of Robotics Research, 31(7) 839-354, 2012.

Smith, M. Schwager and D. Rus “Persistent Tasks for Robots in Changing Environments”, IEEE Transactions on Robotics, 2012, vol. 28, no. 2, pp. 410-426.

Detweiler, M. Doniec, I. Vasilescu, and D. Rus, “Autonomous Depth Adjustment for Underwater Sensor Networks: Design and Applications”, 17(1):16-24, IEEE Transactions on Mechatronics, 2012.**

Smith, M. Schwager, S. Smith, B. Jones, D. Rus, and G. Sukhatme, “Persistent Ocean Monitoring with Underwater Gliders: Adapting Sampling Resolution”, vol 28, no. 5, pp 714-741, Journal of Field Robotics, September-October 2011.

Smith, J. Tumova, C. Belta, and D. Rus, “Optimal Path Planning for Surveillance with Temporal Logic Constraints”, International Journal of Robotics Research, 30(14):1695-1708, December 2011.

Vasilescu, C. Detweiler, and D. Rus, “Color-accurate Imaging Underwater”, Journal of Autonomous Robots, vol. 31, no. 2, pp 285-296, 2011.**

Schwager, B. Julian, M. Angermann, and D. Rus “Eyes in the Sky: Decentralized Control for the Deployment of Robotics Camera Networks”, vol. 99, no. 9, pp 1541-1561, Proceedings of IEEE, September 2011.**

Yun and D. Rus “Optimal Self-assembly of Modular Manipulators with Active and Passive Modules ”, vol 31, no 2-3, pp 181-207 Journal of Autonomous Robots, 2011.**

Lim, H. Balakrishna, D. Gifford, S. Madden, and D. Rus “Stochastic Motion Planning and Applications to Traffic”, International Journal of Robotics Research, 30(6) pp 699-712, 2011.**

Schwager, D. Rus, and J.J Slotine “Unifying Geometric, Probabilistic, and Potential Field Approaches to Multi-Robot Deployment”, International Journal of Robotics Research, March 2011, vol 30, no 3, pp 371-383.**

Doniec, C. Detweiler, I. Vasilescu, M. Chitre, M. Hoffmann-Kuhnt, and D. Rus, Aquaoptical: a lightweight device for high rate long range underwater point-to-point communications. Marine Technology Society Journal, 44(4):55-65, July/August 2010.**

Correll and D. Rus “Peer-to-Peer Learning in Robotics Education: Learning from a Challenge Class”, ASEE Computers in Education Journal, 1(3):60-66, 2010.**

Correll, Nikos Arechiga, Adrienne Bolger, Mario Bollini, Ben Charrow, Adam Clayton, Felipe Dominguez, Kenneth Donahue, Samuel Dyar, Luke Johnson, Huan Liu, Alexander Patrikalakis, Timothy Robertson, Jeremy Smith, Daniel Soltero, Melissa Tanner, Lauren White, and D. Rus “Indoor Gardening: Design and Implementation”, accepted, Intelligent Service Robotics July 2010.**

Torres-Jara, K. Gilpin, J. Karges, R. Wood, and D. Rus, “Composable Felxibe Small Actuators Made for Thin Shape Memory Alloy Sheets”, in IEEE Robotics and Automation Magazine vol 17 no 4, pp 78-87, December 2010.**

Gilpin and D. Rus “Shape Shifting Robots: from Self-Assembly to Self-Disassembly”, in IEEE Robotics and Automation Magazine, pp38-55, vol 17, no 3, September 2010.**

Hawke, B. An, N. Benbernou, H. Tanaka, S. Kim, E. Demaine, D. Rus, and R. Wood, “Programmable Matter by Folding”, in Proceedings of the National Academy of Science, vol 107, no 28, pp 12441-12445, July 2010.**

An, N. Benbernou, E. Demaine, and D. Rus, “Planning to Fold Multiple Objects from a Single Self-Folding Sheet”, Robotica, pp 87-102, 2011.**

Vasilescu, I., Detweiler, C., Doniec, M. Gurdan, D, Sosnowsky, S. Stumpf, I. and Rus, D., “AMOUR V: A Hovering Energy Efficient Underwater Robot Capable of Dynamic Payload”, International Journal of Robotics Research Vol 29, No 5, pp 547-570, May 2010.**

Rus, M. Vona, and K. Quigley, “Eye in Hand Visual Servoing Curriculum for Young Students”, IEEE Robotics and Automation Magazine, Vol 17, No 1 pp116-117, March 2010.

Glover, J., Rus, D., and N. Roy, “Probabilistic Models of Object Geometry with Application to Grasping”, International Journal of Robotics Research vol 28, no. 9, pp 999-1019, August 2009.**

Schwager, M, Rus, D., and J-J Slotine, “Decentralized Adaptive Coverage Control for Networked Robots”, International Journal of Robotics Research vol 28, no. 3, pp 357-375, March 2009.**

Detweiler, C., Vona, M., Yoon, Y., Yun, S., and D. Rus, “Self-assembling Mobile Linkages with Passive and Active Modules”, 14(4) pp 45-55, IEEE Robotics and Automation Society Magazine (December 2007).**

Corke, P., Dunababin, M., Vasilescu, I., and D. Rus, "Experiments with Cooperative Control of Underwater Robots", the International Journal of Robotics Research (2009) vol 28, no 6, pp 815-833, 2009.**

Schwager, C.. Detweiler, I. Vasilescu, D. Anderson, and D. Rus, "Data-driven Identification of Group Dynamics for Motion Prediction and Control", Journal of Field Robotics, 25(6/7) 305-324, Wiley Periodicals, May 2008.

Varshavskaya, L. P. Kaelbling, and D. Rus, "Automated Design of Adaptive Controllers for Modular Robots using Reinforcement Learning", 27(3/4), pp 506-526, the International Journal of Robotics Research (2008).**

Gilpin, K., Kotay, K., Vasilescu, I., and D. Rus, "Miche: Modular Shape Formation by Disassembly", 27(3/4), pp 345-372, the International Journal of Robotics Research (2008).**

Yim, M., Shen, W-M., Salemi, B., Rus, D., Lipson, H., Klavins, E., and Chirikjian, G., "Modular Self-reconfiguring Robot Systems: Opportunities and Challenges", the IEEE Robotics and Automation Magazine, Volume 14, Issue 1, March 2007
Page(s):43 – 52.

Schwager, M., Anderson, D., Butler, Z. and D. Rus, "Robust Classification of Animal Tracking Data", Journal of Computers and Electronics in Agriculture, Elsevier Science, 56(1) pp 46—59, March 2007.**

Donald, B. R., Levey, C., McGray, C., Paprotny, I., D. Rus, "An Untethered, Electrostatic, Globally-Controllable MEMS Micro-Robot," Journal of Micromechanical Systems, 15(1) pp 1—15, 2006.**

Butler, P. Corke, R. Peterson, and D. Rus, "From Robots to Animals: Virtual Fences for Controlling Cows", in the International Journal of Robotics Research, vol 25, no 5—6, pp 1—24, 2006.

Li, Q. and D.L. Rus, "Global Clock Synchronization in Sensor Networks," IEEE Transactions on Computers, 55(2), pages 214-226, February 2006.**

Li, Q. and D.L. Rus, "Navigation Protocols in Sensor Networks," ACM Transactions on Sensor Networks, vol. 1 no. 1, pp 1—33, August 2005.**

Corke, P., Peterson, R. and D.L. Rus. "Communication-assisted Localization and Navigation for Networked Robots," in the International Journal of Robotics Research, vol. 4, no. 9, pp 1—16, September 2005.

Aslam, J., Pelekhov, E. and D.L. Rus, "Persistent Queries over Dynamic Text," International Journal of Electronic Business, vol. 3, no. 3-4, pp. 288–299, 2005.**

Kumar, V., Rus, D.L. and S. Singh. "Robot and Sensor Networks for First Responders," IEEE Pervasive Computing, vol. 3, no. 4, pp 24-34, December 2004.

Aslam, J., Pelekhov, E. and D.L. Rus. "The Star Clustering Algorithm for Static and Dynamic Information Organization," Journal of Graph Algorithms and Applications, vol. 8, no. 1, pp 95–124, 2004.**

Aslam, J., Bratus, S., Kotz, D., Peterson, R., Rus, D.L. and B. Tofel. "The Kerf Toolkit for Intrusion Analysis," IEEE Security and Privacy, 2(6) pp 42–52, 2004.

Butler, Z., Kotay, K., Rus, D.L. and K. Tomita. "Generic Decentralized control for locomotion with self-reconfiguring robots," International Journal of Robotics Research, vol. 23, no. 9, pp 919–938, September 2004.**

Donald, B., Levey, C., McGray, C., Rus, D.L. and M. Sinclair. "Power delivery and locomotion of untethered micro-actuators," Journal of Micromechanical Systems, 10(6) pp 947—959, 2003.**

Butler, Z. and D.L. Rus. "Event-based control for mobile sensor networks," IEEE Pervasive Computing, 2(4), pp 10–18, 2003.

Fitch, R. and D.L. Rus. "Self-Reconfiguring Robots in the USA," Japanese Robotics Society Journal, JRSJ Vol. 21, No. 8, pp.4-10, Nov 2003.**

Butler, Z. and D.L. Rus. "Distributed planning and control for modular robots with unit-compressible modules," International Journal of Robotics Research, Sage publications, vol. 22, no. 9, pp 699–715, 2003.

Li, Q., Peterson, R., de Rosa, M. and D.L. Rus. “Reactive Behavior in Self-reconfiguring Sensor Network,” ACM Mobile Computing and Communications Review, vol. 7, no. 1, pp 56–68, January 2003.**

Aslam, J., Li, Q. and D.L. Rus. “Three Power-aware Routing Algorithms for Sensor Networks,” Wireless Communications and Mobile Computing, vol. 3, pp 187–208, John Wiley and Sons, 2003.**

Cybenko, G., Gray, R., Kotz, D., Peterson, R. and D.L. Rus. “D’Agents: Applications and Performance of a Mobile-Agent System,” Software Practice and Experience, 32(6), 543-573, May 2002.

Li, Q. and D.L. Rus. “Sending Messages in Disconnected Ad-hoc Networks,” Journal of Parallel and Distributed Computing, 63(1), pages 75-86, January 2003.**

Butler, A., Fitch, R. and D.L. Rus. “Distributed control for unit-compressible robots: goal recognition, locomotion, and splitting,” IEEE/ASME Trans. on Mechatronics. vol. 7, no. 4, pp 418–430, 2002.**

Butler, Z., Kotay, K., Rus, D.L and M. Vona. “Self-reconfiguring Robots,” Communications of the ACM, vol. 45, no 3, pp 39–45, 2002.**

Basar, T., Bredin, J., Imer, C., Kotz, D., Maheswaran, R. and D.L. Rus. “Computational Markets to regulate mobile agent systems,” Autonomous Agents and Multi Agent Systems, vol. 6, pp 235–263, Kluwer Academic Publishers, 2003.**

Rus and M. Vona, Crystalline Robots: Slef-reconfiguration with unit-compressible modules, Autonomous Robots 10(1) 107-124, 2001.

Aslam, J., Gazzaniga, M., Grethe, J., vanHorn, J., Kostelec, Pl, Rockmore, D., and D.L. Rus, “The fMRIDC: Challenges and Rewards of large scale databasing of Neuroimaging Studies,” Philosophical Transactions of the Royal Society of London B} no. 356, pp 1323–1339, 2001.

Kotay, K. and D.L. Rus, “The Inchworm Robot: A Multi-functional System,” Autonomous Robots, vol. 8, no. 2, pp 53—69, 1999.**

Kotay, K. and D.L. Rus, “Locomotion Versatility through Self-reconfiguration,” Robotics and Autonomous Systems, 26, pp 217–232, 1999.**

Rus, D.L “In-hand dexterous manipulation of piecewise-smooth objects,” International Journal of Robotics Research, 18(4), 355–381, 1999.

Rus, D.L. “Self-Reconfiguring Robots,” IEEE Intelligent Systems, 13(4), 2-5, July/August 1998.

Allen, J. and D.L. Rus. “Structured Queries in Electronic Corpora,” Journal for Multimedia Tools and Applications on Electronic Publishing, no. 6, pp 153–169, 1998.

Donald, B., Jennings, J. and D.L. Rus. “Minimalism + Distribution = Supermodularity,” Journal of Experimental and Theoretical Artificial Intelligence, 9(1997) 293–321, 1997.

Rus, D.L. “Coordinated reorientation of polygonal parts,” Algorithmica, 19(1/2) 129–147, 1997.

Donald, B., Jennings, J. and D.L. Rus. “Information invariants for cooperating autonomous mobile robots,” International Journal of Robotics Research, 16(5) 673–702, 1997.

Gray, R, Kotz, D., Nog, S., Rus, D.L., Chawala, S. and G. Cybenko. “Agent Tcl: Targeting the needs of mobile computers,” IEEE Journal of Internet Computing, 4(1) 58-68, July-August 1997.

Gray, R., Kotz, D. and D.L. Rus. “Transportable Information Agents,” Journal of Intelligent Information Systems, vol 9, pp 215-238, 1997.

Rus, D.L and D. Subramanian. “Customizing Information Access,” ACM Transactions on Information Systems, 15(1) 67-101, 1997.

Rus, D.L and K. Summers. “Geometric Algorithms and Experiments for Automated Document Structuring,” Journal of Mathematical and Computer Modeling, 26(1) 55-83, Elsevier, 1997.

Rus, D.L. and D. Subramanian. “Customizing multimedia information access,” ACM Computing Surveys, 27(4) 627-629, 1995.

Ranjan, D. and D.L. Rus. “A tool for the analysis of manipulation,” Information Processing Letters 45:117—121, 1993.

Lucrări la conferințe

Cynthia Sung*, James Bern, John Romanishin, Daniela Rus, Reconfiguration Planning for Pivoting Cube Modular Robots, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Javier Alonso-Mora*, Ross A Knepper, Roland Siegwart, Daniela Rus, Local Motion Planning for Collaborative Multi-Robot Manipulation of Deformable Objects, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

John Romanishin*, Kyle Gilpin, Daniela Rus, 3D M-Blocks: Self-reconfiguring Robots Capable of Locomotion via Pivoting in Three Dimensions, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Mikhail Volkov*, Guy Rosman, Dan Feldman, John W. Fisher, Daniela Rus, Coresets for Visual Summarization with Applications to Loop Closure, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Andrew Marchese*, Russ Tedrake, Daniela Rus, Dynamics and Trajectory Optimization for a Soft Spatial Fluidic Elastomer Manipulator, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Shuhei Miyashita*, Steven Guitron, Marvin Ludersdorfer, Cynthia Sung, Daniela Rus, An Untethered Miniature Origami Robot that Self-folds, Walks, Swims, and Degrades, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Mehmet Dogar*, Andrew Spielberg, Stuart Baker, Daniela Rus, Multi-Robot Grasp Planning for Sequential Assembly Operations, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Lindsay Sanneman*, Deborah Ajilo, Joseph DelPreto, Ankur Mehta, Shuhei Miyashita, Negin Abdolrahim Poorheravi, Sehyuk Yim, Sangbae Kim, Daniela Rus, A Distributed Robot Garden System, in *Proceedings of the International Conference on Robotics and Automation* (ICRA), May 2015.

Guy Rosman, Mikhail Volkov, Dan Feldman, John Fisher, Daniela Rus, Coresets for k-segmentation of Steaming Data, in *Proceedings of Neural Information Processing Systems* (NIPS) 2014, pp 559-567, December 2014.

Federico Freis, Shuhei Miyashita, Dana Damian, Rolf Pheifer, Daniela Rus, Elecromagnetically Driven Elastic Actuator, ROBIO 2014, December 2014, Bali Indonesia. Best Paper Award.

Ankur Mehta, Joseph DelPreto, Daniela Rus, "Cogeneration of Mechanical, Electrical, and Software Designs for Printable Robots from Structural Specifications", in *Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS 2014), September 2014, Chicago, IL USA. Best Paper award.

Andrew Marchese, Robert Katzschmann, Daniela Rus, "Whole Arm Planning for a Soft and Highly Compliant 2D Robotic Manipulator", in *Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS 2014), Chicago, IL USA, September 2014.

Jingjin Yu, Mac Schwager, Daniela Rus, "Correlated Orienteering Problem and its Application to Informative Path Planning for Persistent Monitoring Tasks", in *Proceedings of the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS 2014), Chicago, IL USA, September 2014.

Jingjin Yu and Daniela Rus, "Pebble Motion on Graphs with Rotations: Efficient Feasibility Tests and Planning Algorithms", in 2014 *Proceedings of the Workshop on Algorithmic Foundations of Robotics*, Istambul Turkey, August 2014.

Swarun Kumar, Stephanie Gil, Dina Katabi, Daniela Rus, "Accurate Indoor Localization with Zero Startup Cost", In *Proceedings of the 2014 20th Annual Conference on Mobile Computing and Networking* (ACM MOBICOM), Maui, Hawaii, USA, September 2014.**

Ross Knepper, Stephanie Tellex, Nick Roy, Daniela Rus. "Asking for Help Using Inverse Semantics", in *Proceedings of the 2014 Robotics Systems and Science Conference* (RSS 2014), Berkeley, CA, USA July 2014. Best Paper Award.

Robert Katzschmann, Andrew Marchese and Daniela Rus, "Hydraulic Autonomous Soft Fish for 3D Swimming", in *Proceedings of the 2014 International Symposium on Experimental Robotics*, Marrakesh, Morocco, June 2014.

Baoxing Qin, Zhuang Jie Chong, Harold Soh, Tirthankar Bandyopadhyay, Marcelo Ang, Emilio Frazzoli and Daniela Rus, "A spatial-temporal approach for moving object recognition with 2D LIDAR", in *Proceedings of the 2014 International Symposium on Experimental Robotics*, Marrakesh, Morocco, June 2014.

Ankur Mehta, Nicola Bezzo, Byoungkwon An, Peter Gebhard, Vijay Kumar, Insup Lee and Daniela Rus, "A Design Environment for the Rapid Specification and Fabrication of Printable Robots", in *Proceedings of the 2014 International Symposium on Experimental Robotics*, Marrakesh, Morocco, June 2014.

Ross Knepper, Mehmet Dogar, Andrew Spielberg, Changhyun Choi, Henrik Christensen and Daniela Rus, "Towards Coordinated Precision Assembly with Robot Teams", in *Proceedings of the 2014 International Symposium on Experimental Robotics*, Marrakesh, Morocco, June 2014.

Cynthia Sung and Daniela Rus, Foldable Joints for Foldable Robots, in *Proceedings of the 2014 International Symposium on Experimental Robotics*, Marrakesh, Morocco, June 2014.

<u>Byoungkwon An</u>, Shuhei Miyashita, Michael T. Tolley, Daniel M. Aukes, Laura Meeker, Erik D. Demaine, Martin L. Demaine, Robert J. Wood, Daniela Rus, An End-to-End Approach to Making Self-Folded 3D Surface Shapes by Uniform Heating, IEEE International Conference on Robotics and Automation (ICRA), Hong Kong, China, 2014.

Ankur Mehta, Daniela Rus, "An End-to-End System for Designing Mechanical Structures for Print-and-fold Robots", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.

Nora Ayanian, Andrew Spielberg, Matthew Arbesfeld, Jason Strauss, Daniela Rus, "Controlling a Team of Robots with a Single Input", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.

Baoxing Qin, Zhuang Jie Chong, Tirthankar Bandyopadhyay, Marcelo H Ang Jr, Emilio Frazzoli, Daniela Rus, "Learning Pedestrian Activities for Semantic Mapping", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.**

Andrew Marchese, Konrad Komorowski, Cagdas Denizel Onal, Daniela Rus, "Design and Control of a Soft and Continuously Deformable 2D Robotic Manipulation System", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.**

Ryuma Niiyama, Daniela Rus, Sangbae Kim, "Pouch Motors: Printable/Inflatable Soft Actuators for Robotics", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.

Jingjin Yu, Sertac Karaman, Daniela Rus, "Persistent Monitoring of Events with Stochastic Arrivals at Multiple Stations", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.

Byoungkwon An, Shuhei Miyashita, Michael Thomas Tolley, Daniel Aukes, Laura Meeker, Erik Demaine, Martin Demaine, Robert Wood, Daniela Rus, "An End-to-End Approach to Making Self-Folded 3D Surface Shapes by Uniform Heating", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.**

Shuhei Miyashita, Laura Meeker, Maurice Göldi, Yoshihiro Kawahara, Daniela Rus, "Self-Folding Printable Elastic Electric Devices: Resistor, Capacitor, and Inductor", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.**

Rohan Paul, Dan Feldman, Daniela Rus, Paul Newman, "Visual Precis Generation Using Coresets", in *Proceedings of the 2014 IEEE International Conference on Robotics and Automation*, Hong-Kong, June 2014.

Feldman, A. Sugaya, C. Sung, D. Rus, iDiary: from GPS signals to a text-searchable diary, 2013 ACM Sensys, November 2013.*

Miyashita and D. Rus, Self-folding of an origami robot by uniform heating, 2013 Intelligent Robot Systems (IROS), November 2013.

Soltero, B. Julian, C. Onal, D. Rus, A lightweight.modular 12 DOF print-and-fold robot, 2013 Intelligent Robot Systems (IROS), November 2013.

Demian Jie, B. Qin, T. Bandyopadhyay, M. Ang, E. Frazzoli, D. Rus, Mapping with Synthetic 2D Lidar in 3D urban environments, 2013 Intelligent Robot Systems (IROS), November 2013.

Julian, S. Karaman, D. Rus, On mutual information-base control of range-sensing robots for mapping applications, 2013 Intelligent Robot Systems (IROS), November 2013.

Lictenstern, M. Frassi, B. Julian, D. Rus, M. Angermann, Pose and Paste: an intuitive interface for remote navigation of a multi-robot system, 2013 Intelligent Robot Systems (IROS), November 2013.

Romanishin, K. Gilpin, D. Rus, M-blocks: momentum driven magnetic modular robots, 2013 Intelligent Robot Systems (IROS), November 2013.

Tolley, S. Felton, S. Miyashita, B. Shin, L. Xi, D. Rus, R. Wood, Slef-folding shape-memory laminates for automated fabrication, 2013 Intelligent Robot Systems (IROS), November 2013.

Shoen and D. Rus, Decentralized robotic assembly with physical ordering and timing constraints, 2013 Intelligent Robot Systems (IROS), November 2013.

Adib, R. Knepper, J. Wang, D. Katabi, D. Rus, RF-compass: Robot object manipulation using RFIDs, 2013 ACM MOBICOM, September 2013.

Anwar, M. Volkov, and D. Rus, ChangiNOW: A mobile application for efficient taxi allocation at airports, 2013 IEEE Intelligent Transportation Systems Conference (ITSC), September 2013.

Miyashita and D. Rus, Multi-crease folding by uniform heating, European Conference on Artificial Life, September 2013.

Sung, E. Demaine, M. Demaine, D. Rus, Joinig Unfoldings of 3-D Surfaces, ASME 2013 International Design Engineering Technical Conferences (IDETC) and Computers and Information in Engineering Conference (CIE), Portland Oregon August 2013.

Smith, M. Pavone, M. Schwager, E. Frazzoli, and D. Rus. Rebalancing the Rebalancers: Optimally Routing Vehicles and Drivers in Mobility-on-Demand Systems. In American Control Conference, Washington, DC, pages 2368-2373, June 2013.

Sam Felton, Mike Tolley, Cagdas Onal, Daniela Rus, Rob Wood, Robot Self-Assembly by Folding: A Printed Inchworm Robot, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.

Tichakorn Wongpiromsarn, Alphan Ulusoy, Calin Belta,Emilio Frazzoli, Daniela Rus, Incremental Synthesis of Control Policies for Heterogeneous Multi-Agent Systems with Linear Temporal Logic Specifications, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.

Cynthia Sung, Nora Ayanian, and Daniela Rus, Improving the Performance of Multi-Robot Systems by Task Switching, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.**

Ross Knepper and Daniela Rus, On the Completeness of Ensembles of Motion Planners for Decentralized Planning, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.

Stephanie Gil, Dan Feldman, Brian Julian, Ross Knepper, Daniela Rus, K-Robots Clustering of Moving Sensors using Coresets, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.**

Ross Knepper, Todd Layton, John Romanishin, Daniela Rus, IkeaBot: An Autonomous Multi-Robot Coordinated Furniture Assembly System, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.

Baoxing Qin, Tirthankar Bandyopadhyay, Marcelo Ang, Emilio Frazzoli, Daniela Rus, Synthetic 2D LIDAR for Precise Vehicle Localization in 3D Urban Environment, in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.

Streaming using Optical Communication", in *Proceedings of the 2013 IEEE International Conference on Robotics and Automation*, May 2013.**

Marek Donic, Anqi Xu, Daniela Rus, "Robust Real-Time Underwater Digital Video".

Least-violating Control Strategies with Safety Rules, Jana Turmova, Gavin Chase, Sertac Karaman, Emilio Frazzoli, Daniela Rus, Hybrid Systems: Computation and Control Conference, April 2013.

Philip Dames, Mac Schwager, Vijay Kumar, and Daniela Rus, A decentralized control policy for adaptive information gathering in hazardous environments, in the 51 IEEE Conference on Decision and Control, December 2012.

Javed Aslam, Sejoon Lim, Xinghao Pan, Daniela Rus, "City-scale traffic forecasting using a roving sensor network", in *Proceedings of the ACM Conference on Embedded Sensor Networks (SenSys)*, Toronto, Canada, November 2012.**

Zhuang Jie Chong, Baoxing Qin, Tirthankar Bandyopadhyay*, Tichakorn Wongpiromsarn, brice rebsamen, Peilong Dai, Seongwoo Kim, Marcelo H Ang Jr, David Hsu, Daniela Rus, Emilio Frazzoli, "Autonomy for Mobility on Demand", in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.

Tichakorn Wongpiromsarn, Alphan Ulusoy, Calin Belta, Emilio Frazzoli, Daniela Rus, "Incremental Temporal Logic Synthesis of Control Policies for Robots Interacting with Dynamic Agents", in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.

Rohan Paul, Rodolph Triebel, Daniela Rus, Paul Newman, "Semantic Categorization of Outdoor Scenes with Uncertainty Estimates using Multi-Class Gaussian Process Classification", in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.

Stephanie Gil, Daniel Feldman, Daniela Rus, “Communication Coverage for Independently Moving Robots”, in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.**

Daniel Soltero, Mac Schwager, Daniela Rus, “Generating Informative Paths for Persistent Sensing in Unknown Environments”, in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.**

Cynthia Sung, Daniel Feldman, Daniela Rus, “Trajectory Clustering for Motion Prediction”, in *Proceedings of the 2012 International Symposium on Intelligent Robot Systems* (IROS), October 2012.**

Sejoon Lim, Javed Aslam, Daniela Rus, “Congestion-aware traffic routing system using sensor data”, in *Proceedings of the Intelligent Transportations System Conference* (ITSC), Anchorage, Alaska, September 2012.**

Mikhail Volkov, Javed Aslam, Daniela Rus, “Markov-based redistribution policy model for future urban mobility”, in *Proceedings of the Intelligent Transportation Systems Conference*, Anchorage, Alaska, September 2012.**

Kyle Gilpin, Daniela Rus, “What’s in the Bag: A Distributed Approach to 3D Fabrication by Duplication with Modular Robots”, in *Proceedings of the Robotics Systems and Science Conference*, Sydney Australia, 2012.**

Brian Julian, Stephen Smith, Daniela Rus, “Distributed Approximation of Joint Measurement Distributions Using Mixtures of Gaussians”, *Proceedings of the Robotics Systems and Science Conference*, Sydney Australia, July 2012.**

Sejoon Lim, Christian Sommer, Evdokia Nikolova, Daniela Rus, “Practical Route Planning Under Delay Uncertainty: Stochastic Shortest Path Queries”, *Proceedings of the Robotics Systems and Science Conference*, Sydney Australia, July 2012.**

Marek Doniec, Iulian Topor, Mandar Chitre, Daniela Rus, “Autonomous, Localization-Free Underwater Data Muling using Acoustic and Optical Communication”, *Proceedings of the 2012 International Symposium on Experimental Robotics*, June 2012.**

Mario Bollini, Stefanie Tellex, Tyler Thompson, Nick Roy, Daniela Rus, "Interpreting and Executing Recipes with a Cooking Robot", *Proceedings of the 2012 International Symposium on Experimental Robotics*, June 2012.**

Andrew Marchese, Cagdas Onal, Daniela Rus, "A Self-Contained Soft Robotic Fish: On-Board Pressure Generation and Embedded EPM Valves", *Proceedings of the 2012 International Symposium on Experimental Robotics*, June 2012.**

Tirthankar Bandyopadhyay, Zhuang Jie Chong , David Hsu, Marcelo Ang, Daniela Rus, Emilio Frazzoli, "Intention-Aware Pedestrian Avoidance", *Proceedings of the 2012 International Symposium on Experimental Robotics*, June 2012.

Dan Feldman, Andrew Sugaya, and Daniela Rus, An Effective Coreset Compression Algorithm for Large-Scale Sensor Networks, in *Proceedings of the ACM./IEEE International Conference on Information Processing in Sensor Networks* (IPSN), April 2012.**

Sejoon Lim, Daniela Rus, Stochastic Distributed Multi-agent Planning and Applications to Traffic, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.**

Rohan Paul, Dan Feldman, Daniela Rus, Paul Newman, How was your day? Online Visual Workspace Summaries using Incremental Clustering in Topic Space, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.

Andrew Marchese, Daniela Rus, Harry Asada, Controlling the Locomotion of a Separated Inner Robot from an Outer Robot using Electropermanent Magnets, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.**

Kyle Gilpin, Daniela Rus, Digital Fabrication by Shape Duplication, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.**

Byoungkwon An, Daniela Rus, Programming and Controlling Self-Folding Sheets, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.**

Seung-kook Yun, Daniela Rus, Distributed Coverage with Mobile Robots on a Graph: Locational Optimization, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.**

Baoxing Qin, Zhuang Jie Chong, Tirthankar Bandyopadhyay, Marcelo H Ang Jr, Emilio Frazzoli, Daniela Rus, Curb-Intersection Feature Based Monte Carlo Localization on Urban Roads, In *Proceedings of the 2012 International Conference on Robotics and Automation*, May 2012.

Mac Schwager, Daniela Rus, Philip Dames, and Vijay Kumar, "A Multi-Robot Control Policy for Information Gathering in the Presence of Unknown Hazards", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Mac Schwager, Michael Vitus, Claire Tomlin, and Daniela Rus, "Robust Adaptive Coverage for Robotic Sensor Networks", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Stephanie Gil, Sam Prentice, Nick Roy, and Daniela Rus, "Decentralized Control for Optimizing Communication with Infeasible Regions", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Cagdas Onal, Xin Chen, George Whitesudes, and Daniela Rus, "Soft mobile robots with on-board chemical pressure generation", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Brian Julian, Michael Angermann, Mac Schwager, and Daniela Rus, "A Scalable Information Theoretic Approach to Distributed Robot Coordination", In P*roceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

David Stein, Ryan Schoen, and Daniela Rus, "Constraint-Aware Coordinated Construction of Generic Structures", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Alphan Ulusoy, Steven. Smith, C. Belta, and Daniela Rus, "Optimal Multi-Robot Path Planning with Temporal Logic Constraints", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Daniel Soltero, Steven Smith, and Daniela Rus, "Collision Avoidance for Persistent Monitoring in Multi-Robot Systems with Intersecting Trajectories", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.**

Andrew Marchese, Cagdas Onal, and Daniela Rus, "Soft Robot Actuators using Energy-Efficient Valves Controlled by Electropermanent Magnets", In *Proceedings of the 2011 International Symposium on Intelligent Robot Systems*, September 2011.

Xu Chu Ding, Stephen Smith, Calin Belta, and Daniela Rus, "MDP Optimal Control under Temporal Logic Constraints", In *Proceedings of the 50th IEEE Conference on Decision and Control*, 2011.

Marco Pavone, Stephen Smith, Emilio Frazzoli, and Daniela Rus, "Load Balancing for Mobility on Demand Systems", In *Proceedings of 2011 Robotics Systems and Science*, June 2011.

Ryan Smith, Mac Schwager, Stephen L. Smith, Daniela Rus, Gaurav Sukhatme, "Persistent Ocean Monitoring with Underwater Gliders: Towards Accurate Reconstruction of Dynamic Ocean Processes", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.

Mac Schwager, Nathan Michael, Vijay Kumar, Daniela Rus, "Time Scales and Stability in Networked Multi-Robot Systems", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.

Cagdas Denizel Onal, Robert Wood, Daniela Rus, "Towards Printable Robotics: Origami-Inspired Planar Fabrication of Three-Dimensional Mechanisms", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.

Stephen L. Smith, Mac Schwager, Daniela Rus, "Persistent Monitoring of Changing Environments using a Robot with Limited Range Sensing", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.

Anna Derbakova, Nikolaus Correll, Daniela Rus, "Decentralized Self-Repair to Maintain Connectivity and Coverage in Networked Multi-Robot Systems", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.

Kyle Gilpin, Kent Koyanagi, Daniela Rus, "Making Self-Disassembling Objects with Multiple Components in the Robot Pebbles System", In *Proceedings of the 2011 International Conference on Robotics and Automation*, May 2011.**

Nikolaus Correll, Cagdas Onal, Haiyi Liang, Erik Schoenfeld, and Daniela Rus, "Soft Autonomous Materials: Using Programmed Elasticity and Embedded Distributed Computation", in *Proceedings of the 2010 International Symposium on Experimental Robotics*, December 2010.

Kyle Gilpin, Eduardo Torres-Jara, and Daniela Rus, "Controlling Closed-Chair Robots with Compliant SMA Actuators: Algorithms and Experiments", in *Proceedings of the 2010 International Symposium on Experimental Robotics*, December 2010.

Nathan Michael, Vijay Kumar, Mac Schwager, and Daniela Rus, "An Experimental Study of Time Scales and Stability in Multi-Robot Systems", in *Proceedings of the 2010 International Symposium on Experimental Robotics*, December 2010.

Marek Doniec, Carrick Detweiler, Daniela Rus, "Learning Thruster Configurations for Manually Reconfigurable Underwater Robots", in *Proceedings of the 2010 International Symposium on Experimental Robotics*, December 2010.

Carrick Detweiler, Marek Doniec, Mingshung Jian, Mac Schwager, Bob Chen, and Daniela Rus, "Adaptive Decentralized Control of Underwater Sensor Networks for Modeling Underwater Phenomena", in *Proceedings of the 2010 International Conference on Sensor Networks*, November 2010.

Marek Doniec, Iuliu Vasilescu, Carrick Detweiler, Daniela Rus, "Complete SE(3) Underwater Robot Control with Arbitrary Thruster Configurations", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.

Byoungkwon An, Daniela Rus, Making Shapes from Modules by Magnification, in *Proceedings of the 2010 International Symposium on Intelligent Robot Systems* (IROS), October 2010.**

Marek Doniec, Carrick Detweiler, Iuliu Vasilescu, Daniela Rus, Using Optical Communication for Remote Underwater Robot Operation, in *Proceedings of the 2010 International Symposium on Intelligent Robot Systems* (IROS), October 2010.**

Adrienne Bolger, Matthew Faulkner, David Stein, Lauren White, Seung-kook Yun, Daniela Rus, Experiments in Decentralized Robot Construction with Tool Delivery and Assembly Robots, in *Proceedings of the 2010 International Symposium on Intelligent Robot Systems* (IROS), October 2010.**

Andreas Breitenmoser*, Jean-Claude Metzger, Roland Siegwart, Daniela Rus, Distributed coverage control on surfaces in 3D space, in *Proceedings of the 2010 International Symposium on Intelligent Robot Systems* (IROS), October 2010.

Stephen L. Smith*, Jana Tumova, Calin Belta, Daniela Rus, Optimal Path Planning under Temporal Logic Constraints, in *Proceedings of the 2010 International Symposium on Intelligent Robot Systems* (IROS), October 2010.

Iuliu Vasilescu, Carrick Detweiler, and Daniela Rus, "Color Accurate Underwater Imaging Using Perceptual Adaptive Illumination", in *Proceedings of the 2010 International Conference on Robotics Systems and Science*, June2010.

Stephanie Gil, Mac Schwager, Brian Julian, Daniela Rus, "Distributed Control for Optimization of a Communication Network", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.

Andreas Breitenmoser, Mac Schwager, Jean-Claude Metzger, Roland Siegwart, Daniela Rus, "Voronoi coverage of non-convex environments with a group of networked robots", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.

Kyle Gilpin, Ara Knaian, Daniela Rus, "Robot Pebbles: One Centimeter Modules for Programmable Matter through Self-Disassembly", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.

SangOk Seok, Cagdas Onal, Robert Wood, Daniela Rus, Sangbae Kim, "Peristaltic locomotion with antagonistic actuators in soft robotics", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.

S-K. Yun and D. Rus "Adaptation to robot failures and shape change in decentralized construction", in *Proceedings of the 2010 International Conference on Robotics and Automation*, May 2010.**

Correll, Nikos Arechiga, Adrienne Bolger, Mario Bollini, Ben Charrow, Adam Clayton, Felipe Dominguez, Kenneth Donahue, Samuel Dyar, Luke Johnson, Huan Liu, Alexander Patrikalakis, Timothy Robertson, Jeremy Smith, Daniel Soltero, Melissa Tanner, Lauren White, and D. Rus, Building a Distributed Robot Garden, in *Proceedings of the 2009 International Symposium on Intelligent Robot Systems* (IROS), October 2009. Nominated for the Best Paper Award.**

S-K Yun, M. Schwager, and D. Rus, "Coordinating Construction of Truss Structures using Distributed Equal Mass Partitioning", in *Proceedings of the 2009 International Symposium on Robotics Research*, Luzern Switzerland September 2009.**

Schwager, J-J. Slotine, and D. Rus, "Unifying Geometric, Probabilistic, and Potential Field Approaches to Multi-Robot Coverage Control", in *Proceedings of the 2009 International Symposium on Robotics Research*, Luzern Switzerland September 2009.**

Deshpande, S. Poduri, D. Rus, and G. Sukhatme, Distributed Coverage Control for Mobile Sensors with Location-dependent Sensing Models, In *Proceedings of the 2009 International Conference on Robotics and Automation* (May 2009).**

Yun, D. Hjelle, H. Lipson, and D. Rus, Planning the Reconfiguration of Grounded Truss Structures with Truss Climbing Robots that Carry Truss Elements, In *Proceedings of the 2009 International Conference on Robotics and Automation* (May 2009).**

Correll, D. Rus, J. Bacharach, and D. Vickery, Ad-hoc Wireless Network Coverage with Robots that Can Not Localize. In *Proceedings of the 2009 International Conference on Robotics and Automation* (May 2009).**

Schwager, B. Julian, and D. Rus. Optimal Coverage with Multiple Hovering Robots with Downward-facing Cameras. In *Proceedings of the 2009 International Conference on Robotics and Automation* (May 2009).**

Donald, C. Levy, I. Paprotny, and D. Rus, Simultaneous Control of Multiple MEMS robots, accepted the 2008 Workshop on Algorithmic Foundations of Robotics, Dec 2008.

Lim, H. Balakrishnan, D. Gifford, S. Madden, and D. Rus, Stochastic Motion Planning and Applications to Traffic, in the 2008 Workshop on Algorithmic Foundations of Robotics, Dec 2008.

Pimenta, M. Schwager, Q. Lindsey, V. Kumar, D. Rus, R. Mesquita, and G. Pereira, Tracking Intruders with Mobile Sensor Networks, in 2008 Workshop on Algorithmic Foundations of Robotics, Dec 2008.

Varshavskaya, L. Kaelbling, and D. Rus. Efficient Distributed Reinforcement Learning Through Agreement, 2008 Distributed Agents and Robot Systems (DARS), November 2008.

Basha, S. Ravela, and D. Rus, Model-based Monitoring for Early Warning Flood Detection, 2008 ACM Sensys, November 2008.**

S-K. Yun and D. Rus, Optimal Distributed Planning for Self-assembly of Modular Manipulators, 2008 International Symposium on Intelligent Robot Systems, 2008.**

Linga, B. Roy, H. Asada, and D. Rus, An Optical External Localization System and Applications to Indoor Tracking, 2008 International Symposium on Intelligent Robot Systems, September 2008.**

Correll, M. Schwager, and D. Rus, Social Control of Herd Animals by Integration of Artificially Controlled Congeners, 2008 Simulation of Adaptive Behavior, July 2008, Best Paper Award.

Schwager, J. McLurkin, J.-J Slotine, and D. Rus, From Theory to Practice: Distributed Coverage Control for Groups of Robots, 2008 International Symposium on Experimental Robotics, July 2008.**

Detweiler, S. Sosnowsky, I. Vasilescu, and D. Rus, Saving Energy with Buoyancy and Balance Control for Underwater Robots, 2008 International Symposium on Experimental Robotics, July 2008.**

Glover, N. Roy, and D. Rus. Probabilistic Models of Object Geometry for Grasp Planning, 2008 Robotics Systems and Science, June 2008.

S-K Yun and D. Rus, Self-Assembling Linkages with Active and Passive Modules, 2008 International Conference on Robotics and Automation, May 2008.**

Schwager, J-J. Slotine, and D. Rus, Consensus Learning for Distributed Coverage Control, 2008 International Conference on Robotics and Automation, May 2008.**

Schwager, F. Bullo, D. Skelly, and D. Rus, A Ladybug Exploration Contrl Strategy for Distributed Adaptive Coverage Control, 2008 International Conference on Robotics and Automation, May 2008.**

S-K Yun and D. Rus, Optimal Distributed Planning of Multi-Robot Placement on a 3D Truss, in the 2007 International Symposium on Intelligent Robot Systems (October 2007).**

Vasilescu, C. Detweiler, and D. Rus, Aquanodes: an Underwater Sensor Network, in *Proceedings of the Second ACM International Workshop on Underwater Sensor Networks*, Montreal Canada, September 2007.**

Detweiler, I. Vasilescu, and D. Rus. An underwater sensor network with dual communications, sensing, and mobility, in *Proceedings of IEEE/OES OCEANS 2007*, Aberdeen, Scotland, June 2007.**

Gurdan, D., Stumpf, J., Achtelik, M., Doth, K.M., Hirzinger, G., and Rus, D., Energy-efficient Autonomous Four-rotor Flying Robot Controlled at 1kHz, In *Proceedings of the 2007 International Conference on Robotics and Automation* (April 2007).**

Corke, P., Peterson, R., and Rus, D.L., Finding Holes in Sensor Networks, *Proceedings of the ICRA 2007 Workshop on Networked Robots*, 2007 International Conference on Robotics and Automation (April 2007).**

Schwager, M, and Rus, D.L., Data-driven Identification of Group Dynamics for Model Prediction and Control, *Proceedings of the 2007 International Conference on Field and Service* (July 2007).**

Schwager, M., Slotine, J.J., and Rus, D. Decentralized Adaptive Control for Coverage for Networked Robots, In *Proceedings of the 2007 International Conference on Robotics and Automation* (April 2007).**

Corke, P., Detweiler, C., Dunbabin, M., Hamilton, M., Rus, D.L., and Vasilescu, I. Experiments with Underwater Robot Localization and Tracking, In *Proceedigns of the 2007 International Conference on Robotics and Automation* (April 2007).**

Yoon, Y., and Rus, D.L., Shady3D: A Robot that Climbs 3D Trusses, In *Proceedings of the 2007 International Conference on Robotics and Automation* (April 2007).**

Gilpin, K., Kotay, K. and Rus, D.L., Miche: Modular Shape Formation by Self-Dissassembly, In *Proceedings of the 2007 International Conference on Robotics and Automation* (April 2007).**

Schwager, J. McLurkin, D. Rus, Distributed Coverage Control with Sensory Feedback for Networked Robots, In *Proceedings of the 2006 International Conference on Robotics Systems and Science* (August 2006).**

Detweiler, J. Leonard, D. Rus, and S. Teller, Passive Mobile Robot Localization within a Fixed Beacon Field, In *Proceedings of the 2006 International Workshop on Algorithmic Foundations of Robotics* (August 2006).**

Detweiler, M. Vona, and D. Rus, Shady: Robust Truss Climbing with Mechanical Compliance, In *Proceedings of the 2006 International Symposium on Experimental Robotics* (July 2006).**

Werfel, J., Bar-Yam, Y., Rus, D.L, and Nagpal, R., Distributed Construction by Mobile Robots with Enhanced Building Blocks, in *Proceedings of the 2006 International Conference on Robotics and Automation* (May 2006).**

Detweiler, M. Vona, and D. Rus, Hierarchical Control for Self-assembling Mobile Trusses with Passive and Active Links, in *Proceedings of the 2006 International Conference on Robotics and Automation* (May 2006).**

Dunbabin, I,. Vasilescu, P. Corke, and D. Rus, Data Muling over an underwater sensor network with an autonomous underwater vehicle, in *Proceedings of the 2006 International Conference on Robotics and Automation* (May 2006).**

Dunbabin, I. Vasilescu, P. Corke, and D. Rus, Cooperative navigation experiments with two underwater autonomous vehicles, In *Proceedings of the 2006 International Symposium on Experimental Robotics* (July 2006).**

Vasilescu, P. Corke, M. Dunbabin, K. Kotay, and D. L. Rus, "Data Collection, Storage, and Retrieval with an Underwater Sensor Network", in *Proceedings of the ACM Sensys* 2005 (November 2005).**

Donald, C. Levey, C. McGray, I. Paprotny, and D. L. Rus, "A steerable untethered, 250 x 60 mm MEMS Mobile Mico-Robot ", in *Proceedings of the 2005 International Symposium on Experimental Robotics* (October 2005).**

Kotay, K., Peterson, R., and D. L. Rus, "Experiments with Robots and Sensor Networks for Mapping and Navigation", in *Proceedings of Field and Service Robotics* (July 2005).

Bredin, E. Demaine, M. Hajiaghayi, and D. L. Rus, "Deploying Sensor Networks with Guaranteed Capacity and Fault Tolerance," in *Proceedings of the ACM International Symposium on Mobile Ad-hoc Networking (MOBIHOC 2005)* (June 2005).

Kotay, K. and D.L. Rus, "Efficient Locomotion for a Self-reconfiguring Robot" in *Proceedings of the IEEE International Conference on Robotics and Automation* (April 2005).

Fitch, R., Butler, Z. and D.L. Rus, "Reconfiguration Planning Among Obstacles for Heterogeneous Self-reconfiguring Robots," in *Proceedings of the IEEE International Conference on Robotics and Automation* (April 2005).**

Rus, D.L. and M. Vona, "Vornoi toolpath for mechanical etch: simple and intuitive algorithms with the 3D GPU," in *Proceedings of the IEEE International Conference on Robotics and Automation* (April 2005).**

Vasilescu, I., Kotay, K., Rus, D.L. and P. Varshavskaya "Autonomous Modular Optical Underwater Robot (AMOUR): design, prototype, and feasibility study," in *Proceedings of the IEEE International Conference on Robotics and Automation* (April 2005).**

Kotay, K. and D.L. Rus, "Efficient Locomotion Gait for a self-reconfiguring robot," in *Proceedings of the IEEE International Conference on Robotics and Automation* (April 2005).

Varshavskaya, P., Kaelbling, L., and D.L. Rus, "Distributed Reinforcement Learning for Controlling Locomotion for Self-reconfiguring Robots," P*roceedings of the IEEE/RSJ International Symposium on Intelligent Robot Systems* 2005.**

Kotay, K. and D.L. Rus, "Generic Distributed Assembly and Repair Algorithms for Self-Reconfiguring Robots," P*roceedings of the IEEE/RSJ International Symposium on Intelligent Robot Systems* 2005.

Moore, D., Leonard, J., Rus, D.L., and S. Teller, "Robust Distributed Network Localization with Noisy Range Measurements," in *Proceedings of ACM SenSys* 2004 (November 2004) (Best Paper Award).**

Li, Q. and D.L. Rus, "Global Clock Synchronization for Sensor Networks," in *Proceedings of Infocom* 2004. (March 2004).**

Butler, Z., Corke, P., Peterson, R. and D.L. Rus, "Dynamic Virtual Fences for Controlling Cows," in *Proceedings of the International Symposium on Experimental Robotics* 2004.

Corke, P., Peterson, R. and D.L. Rus, "Robot Localization and Navigation with Sensor Networks," In *Proceedings of the International Conference on Distributed Autonomous Robot Systems* 2004.

Corke, P., Hrabar, S., Peterson, R., Rus, D.L., Saripalli, S., and G. Sukhatme, "Deployment and Connectivity Repair of a Sensor Network with a Flying Robot," in *Proceedings of the International Symposium on Experimental Robotics* 2004.

Butler, Z., Corke, P., Peterson, R. and D.L. Rus, "Virtual fences for controlling cows," in *Proceedings of the IEEE International Conference on Robotics and Automation* 2004.

Corke, P., Hrabar, S., Peterson, R., Rus, D.L., Saripalli, S., and G. Sukhatme, "Autonomous Deployment and Repair of a Sensor Network using an Unmanned Aerial Vehicle," In *Proceedings of the IEEE International Conference on Robotics and Automation* 2004.

Peterson, R., and D.L. Rus, "Interacting with a sensor network," in *Proceedings of the IEEE International Conference on Robotics and Automation* 2004.

Butler, Z. and D.L. Rus, "Controlling mobile sensors for monitoring events with coverage constraints," in *Proceedings of the IEEE International Conference on Robotics and Automation* 2004.

Corke, P., Peterson, R. and D.L. Rus, "Networked Robots: Flying robot navigation with a sensor network," in *Proceedings of International Symposium on Robotics Research 2003* (October 2003), Experimental Robotics IX, Star Springer Tracts in Advanced Robotics, Springer 2004.

Donald, B., Levey, C., McGray, C., Rus, D.L., and M. Sinclair, "Untethered micro-actuators for autonomous micro-robot locomotion: design, fabrication, control, and performance," in Proceedings of the 2003 *International Symposium on Robotics Research, Experimental Robotics IX, Star Springer tracts in advanced robotics, Springer* 2004.**

Aslam, J., Butler, Z., Constantinescu, F., Crespi, V. and D.L. Rus, "Tracking a moving object with a binary sensor network," in *Proceedings of ACM SenSys 2003* (November 2003).**

Fitch, R., Butler, Z., and D.L. Rus, "Self-reconfiguration Algorithms for Heterogeneous Systems," in *IEEE/RSJ International Symposium on Intelligent Robot Systems 2003* (October 2003).**

Das, A., Kantor, G., Kumar, V., Pereira, G., Peterson, R., Rus, D.L., Singh, S. and J. Spletzer, "Distributed Search and Rescue with Robot and Sensor Teams," in *Proceedings of the International Conference on Field and Service Robotics* 2003.

Donald, B., Levey, C., McGray, C., Rus, D.L. and M. Sinclair, "Power delivery and locomotion of untethered micro-actuators," in *Proceedings of IEEE MEMS* (January 2003).**

Li, Q., deRosa, M. and D.L. Rus, "Distributed algorithms for guiding navigation across sensor networks," in *Proceedings of ACM Mobicom* 2003.**

Butler, Z. and D.L. Rus, "Distributed motion planning for 3D unit-compressible robots with a Pac-Man-style algorithm," in *Proceedings of Workshop on Algorithmic Foundations on Robotics 2002* (December 2002).

Butler, Z., Fitch, R. and D.L. Rus, "Experiments in distributed locomotion with modular unit-compressible robots," in *Proceedings of IEEE/RSJ International Symposium on Intelligent Robot Systems 2002* (September 2002).**

Butler, Z., Fitch, R. and D.L. Rus, "Experiments in self-replication with modular unit-compressible robots," in *Proceedings of International Symposium on Experimental Robotics 2002* (July 2002).**

Butler, Z., Murata, S. and D.L. Rus, "Distributed replication algorithms for self-reconfiguring modular robots," in *Proceedings of Distributed Autonomous Robots 2002 (International Conference on Distributed Autonomous Robot Systems 2002)* (June 2002).

Butler, Z., Kotay, K., Rus, D.L. and K. Tomita, "Generic Decentralized Control for a Class of Self-Reconfigurable Robots," in *Proceedings of IEEE International Conference on Robotics and Automation 2002* (May 2002).**

Butler, Z., Fitch, R., Rus, D.L. and Y. Wang, "Distributed Goal Recognition Algorithms for Modular Robots," in *Proceedings of IEEE International Conference on Robotics and Automation* (May 2002).**

Aslam, J., Li, Q. and D.L. Rus, "Distributed Energy-Conserving Routing Protocols for Sensor Networks," in *Proceedings of the IEEE Hawaii International Conference on System Science*, 2002.**

Li, Q. and D.L. Rus, "Message Relay in Disconnected Ad-hoc Networks," in *Proceedings of the 2002 IEEE MASCOTS Workshop on Mobility and Wireless Access*, 2002.**

Rus, D.L., Stein, C. and R. Xie, "Scheduling Multi-task Agents," in *Proceedings of the 2001 IEEE Conference on Mobile Agents* (December 2001).**

Butler, Z., Byrnes, S. and D.L. Rus, "Distributed motion planning for self-reconfigurable robots," in *Proceedings of IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 2001).**

Fitch, R., Butler Z., and D.L. Rus, "3D Rectilinear Motion Planning with Minimum Bend Paths," in *Proceedings of IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 2001).**

Aslam, J., Li, Q. and D.L. Rus, "Online Power-aware Routing in Ad-hoc Wireless Networks," in *Proceedings of the International conference on Mobile Computing* MOBICOM 2001 (July 2001).**

Aslam, J., Cremonini, M., Kotz, D. and D.L. Rus, "Using Mobile Agents for Analyzing Intrusion in Computer Networks," in *Proceedings of the Seventh ECOOP Workshop on Mobile Object Systems* (June 2001).

Rus, D.L., Stein, C. and R. Xie, "Scheduling Multi-task Multi-agent Systems," in *Proceedings of the 2001 Conference on Autonomous Agents* (May 2001).**

Kotay, K., Rus, D.L. and M. Vona, "Using Modular Self-reconfiguring Robots for Locomotion," in *Proceedings of the 2000 International Symposium on Experimental Robotics* (December 2000).**

Aslam, J., Pelekhov, K. and D.L. Rus, "Applications of clustering to filtering and persistent queries," in *Proceedings of the International Conference on Information Knowledge Management 2000* (November 2000).**

Rus, D.L. and M. Vona, "A General Basis for Self-reconfiguring robots and its instantiation using Crystal Modules," in *Proceedings of the 2000 IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 2000).**

Kotay, K. and D.L. Rus, "Algorithms for Self-reconfiguring Molecule Motion Planning," in *Proceedings of the 2000 IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 2000).**

Rus, D.L. and M. Vona, "A physical implementation of the Self-reconfiguring Crystalline Robot," in *Proceedings of the International Conference on Robotics and Automation* (September 2000).**

Donals, B., Gariepy, L. and D.L. Rus, "Distributed Manipulation of Multiple Objects using Ropes," in *Proceedings of the International Conference on Robotics and Automation* (September 2000).**

Li, Qun and D.L. Rus, "Sending messages in mobile ad-hoc disconnected networks," in *Proceedings of the International conference on Mobile Computing* MOBICOM 2000 (August 2000).**

Bredin, J., Kotz, D. and D.L. Rus, "Trading risk in mobile-agent computational markets," in *Proceedings of the 2000 Conference on computational economics* (July 2000).**

Aslam, J., Pelekhov, K. and D.L. Rus, "Information organization algorithms," in *Proceedings of the SSGRR Conference*" (July 2000).**

Basar, T., Bredin, J., Imer, C., Kotz, D. Maheswaran, R. and D.L. Rus, "A game-theoretic formulation of multi-agent resource allocation," in *Proceedings the 2000 International Conference on Autonomous Agents* (AA 2000) (June 2000).**

Fitch, R., Rus, D.L. and M. Vona, "A Basis for Self-Repair Robots Using Self-Reconfiguring Crystal Modules," In *Proceedings of the 6th International Conference on Intelligent Autonomous Systems* (July 2000).**

Kotay, K. and D.L. Rus, "A Scalable Parallel Algorithm for Configuration Planning for Self-reconfiguring Robots," in *Proceedings of the conference on Sensor Fusion and Decentralized Control in Robotic Systems III* (SPIE RB06) (April 2000).**

Aslam, J., Reiss, F. and D.L. Rus, "Scalable Information Organization," in *Proceedings of RIAO 2000 (Content-based information access)* (April 2000).**

Lawrie, D., and D.L. Rus, “The Self-organized File Cabinet,” in *Proceedings of the 1999 International Conference on Information Knowledge Management* (CIKM 99), (November 1999).**

Kone, Z., Rus, D.L. and R. Weiss, “Recent Results on Distributed Object Recognition,” in *SPIE 1999, Sensor Fusion and Decentralized Control in Robotic Systems II* (September 1999).**

Rus, D.L. and M. Vona, “Self-reconfiguration planning with Compressible Unit Modules,” in *Proceedings of the 1999 IEEE International Conference on Robotics and Automation* (May 1999).**

Bredin, J., Kotz, D. and D. L. Rus, “Economic Markets as a Means of Open Mobile-Agent Systems,” in *Proceedings of the Workshop of Mobile Agents in the Context of Competition and Cooperation, the Third International Conference on Autonomous Agents*, (May 1999).**

Erdmann, M., Mason, M., Pai, D., Rus, D.L. and L. Taylor, “A Mobile Manipulator,” in *Proceedings of the 1999 IEEE International Conference on Robotics and Automation* (May 1999).

Erdmann, M., Howell, J., Mason, M., Pai, D., Rus, D.L. and L. Taylor, “Experiments with Desktop Mobile Manipulators,” *Proceedings of the 1999 International Symposium on Experimental Robotics* (March 1999).**

Donald, B., Gariepy, L. and D.L. Rus, “Experiments in Constrained Prehensile Manipulation: distributed manipulation with ropes,” in *Proceedings of the 1999 International Symposium on Experimental Robotics* (March 1999).**

Aslam, J., Pelekhov, K. and D.L. Rus, “A practical clustering algorithm for static and dynamic information organization,” in *Proceedings of the 1999 ACM Symposium on Discrete Algorithms* (SODA99), Baltimore, MD (January 1999).**

Aslam, J., Pelekhov, K. and D.L. Rus, “Static and Dynamic Information Organization with Star Clusters,” In *Proceedings of the 1998 Conference on Intelligent Knowledge Management*, Washington, DC (November 1998).**

McGray, C. and D.L. Rus, “Self-reconfiguring Molecules as 3D Metamorphic Robots,” *Proceedings of the 1998 IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 1998.**

Kotay, K. and D.L. Rus, “Motion Synthesis for the Self-reconfiguring Molecule,” in *Proceedings of the 1998 IEEE/RSJ International Symposium on Intelligent Robot Systems* (October 1998).**

Kotay, K., McGray, C., Rus, D.L., and M. Vona, “The Self-Reconfigurable Robotic Molecule,” in *Proceedings of the 1998 IEEE International Conference on Robotics and Automation* (May 1998).**

Bredin, J., Kotz, D. and D.L. Rus, “Market-based Resource Control for Mobile Agents,” in *Proceedings of the 1998 ACM International Conference on Autonomous Agents* (May 1998).**

Kotay, K. and D.L. Rus, “Task-reconfigurable Robots: Navigators and Manipulators,” in *Proceedings of the 1997 IEEE/RSJ International Symposium on Intelligent Robot Systems* (September 1997).**

Rus, D.L. and P. deSantis, “The Self-Organizing Desk,” in *Proceedings of the 1997 International Joint Conference on Artificial Intelligence, Nagoya, Japan*, (August 1997).**

Aslam, J., Pelekhov, K. and D.L. Rus, “Using High-quality Clusters for Summarizing and Visualizing Large Document Collections,” in *Proceedings of the 1997 SIGIR Workshop on Information Summarization and Visualization*, (August 1997).**

Kotay, K. and D.L. Rus, “Task-reconfigurable robots,” in *Proceedings of the 1997 International Symposium on Experimental Robotics* (June 1997).**

Rus, D.L., “On-line Algorithms for Distributed Manipulation,” *Proceedings of the Second International Conference on Computational Neuroscience*, (March 1997).

Cybenko, G., Gray, R., Kotz, D., Nog, S. and D.L. Rus, “Mobile Agents: a New Direction for Distributed Computing,” In *Proceedings of the Second Aizu International Symposium on Parallel Algorithms/Architectures Synthesis, Fukushima, Japan*, (March 1997).**

Gray, R., Kotz, D., and D.L. Rus, "Transportable Information Agents," in *Proceedings of the 1997 ACM International Conference on Autonomous Agents*, (February 1997).**

Kotay, K., Kabir, A., Rus, D.L., and M Soutter, "Guiding distributed manipulation with mobile sensors," in *Proceedings of the 1996 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems*, (December 1996).

Kotay, K. and D.L. Rus, "Navigating 3d Steel Web Structures with an Inchworm Robot," in *Proceedings of the 1996 IEEE/RSJ International Conference on Intelligent Robot Systems*, (November 1996).**

Gray, R., Kotz, D., and D.L. Rus, "Transportable Agents support Distributed Worldwide Applications," in *Proceedings of the ACM SIGOPS'96*, (September 1996).**

Gray, R., Kotz, D., and D.L. Rus, "Autonomous and Adaptive Agents that Gather Information," in *Proceedings of the AAAI96 Workshop on Intelligent Adaptive Agents*, (August 1996).**

Allan, J. and D.L. Rus, "Does navigation require more than one compass," in *Proceedings of 1995 AAAI Fall Symposium of AI Applications in Knowledge Navigation and Retrieval*, (November 1995). Also in the *Proceedings of the 1996 Pacific-Rim Conference on Artificial Intelligence*, (August 1996).

Donald, B., Jennings, J., and D.L. Rus, "Moving furniture with teams of autonomous robots," in *Proceedings of the 1995 IEEE/RSJ International Symposium on Intelligent Robot Systems*, (August 1995).

Bohringer, K., Brown, R., Donald, B., Jennings, J. and D.L. Rus, "Information Invariants for distributed manipulation: experiments in minimalism," in *Proceedings of the 1995 International Symposium on Experimental Robotics*, (July 1995).

Allan, J. and D.L. Rus, "Structural queries in electronic corpora," in *Proceedings of DAGS95: Electronic Publishing and the Information Superhighway*, (May 1995).

Donald, B., Jennings, J., and D.L. Rus, "Analyzing teams of cooperating mobile robots," in *Proceedings of the 1994 IEEE International Conference on Robotics and Automation*, (May 1994).

Rus., D.L. and K. Summers, "Using whitespace for automated document structuring," in *Proceedings of the 1994 International Workshop on Principles of Document Processing*, (April 1994).**

Rus, D.L., and D. Subramanian, "Modular architectures for information agents," in *Proceedings of the AAAI Symposium on Intelligent Software Agents*, (March 1994).

Donald, B., Jennings, J., and D.L. Rus, "Information Invariants for Distributed Manipulation" in *Proceedings of the Workshop on the Algorithmic Foundations of Robotics*, (February 1994).

Rus, D.L., and D. Subramanian, "Multi-media RISSC Informatics: Retrieving Information with Simple Structural Components," in *Proceedings of the International Conference on Information Knowledge Management*, (November 1993).

Allan, J., Davis, J., Krafft, D., Rus, D.L., and D. Subramanian, "Information Agents for Building Hyperlinks," in *Proceedings of the CIKM Workshop on Intelligent Hypertext*, (November 1993).

Donald, B., Jennings, J., and D.L. Rus, "Information Invariants for Cooperating Autonomous Mobile Robots," in *Proceedings of the International Symposium on Robotics Research*, (October 1993).

Jennings, J. and D.L. Rus, "Active Model Acquisition for Near-Sensorless Manipulation with Mobile Robots," in *Proceedings of the IASTED International Conference on Robotics and Manufacturing*, (September 1993).

Donald, B., Jennings, J., and D.L. Rus, "Experimental Information Invariants for Coordinated Manipulation," in *Proceedings of the Workshop on Dynamically Interacting Robots, The International Joint Conference on Artificial Intelligence*, (August 1993).

Rus, D.L., "Coordinated Manipulation of Polygonal Objects," in *Proceedings of the 1993 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (July 1993).

Back, A. and D.L. Rus, “Towards Task-Directed Coordinated Manipulation,” in *Proceedings of the IEEE/RSJ 1993 International Conference on Intelligent Robots and Systems*, (July 1993).

Rus, D.L., “A Simulation System for Manipulation,” in *Proceedings of The Annual European Computer Conference*, (May 1993).

Rus, D.L., “Dexterous Rotations of Polyhedra,” *Proceedings of the 1992 IEEE International Conference on Robotics and Automation*, Nice, France, (May 1992).

Rus, D.L., “A Framework for Dexterous Manipulation Using Lie Algebras,” *Proceedings of the 1991 International Conference on Algebraic Methodology and Software Technology*, (May 1991).

Rus, D.L., “Dexterous Rotations of Polygons,” in *Proceedings of the Second Canadian Computational Geometry Conference*, Ottawa, Canada, (August 1990).