

Curriculum Vitae – Illah R. Nourbakhsh

Kavcic-Moura Professor of Robotics, Carnegie Mellon University
Former K&L Gates Professor of Ethics & Computational Technologies
Executive Director, Center for Shared Prosperity
Director, CREATE Laboratory
Kavli Fellow, National Academy of Sciences
Hasting Center Fellow
Trustee, Claude Worthington Benedum Foundation
Trustee and former Chairman, Southwestern Pennsylvania Environmental Health Project
Trustee and Vice President, Winchester Thurston School
Director and co-founder, Open Planet (United Kingdom CIC)
Former Head of Robotics Group, NASA/Ames ; retired NASA GS15/10

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Research Interests

Community-based Robotics, with an emphasis on complete design, fielding and evaluation cycles, formal educational evaluation, vision-based human-robot interaction, community robotic empowerment. Interest include autonomous, deliberate systems, human-robot systems.

Education

Ph.D.	Computer Science, Stanford University Dissertation: Interleaving Planning and Execution Advisor: Professor Michael R. Genesereth	1992-1996
M.S.	Computer Science, Stanford University	1992-1994
B.S.	Computer Science, Stanford University	1988-1992

Elected and Appointed Offices and Honors

•	Earth Decides Advisory Board	2023
•	Advisory Board, VIROS Project on robotics, law and social science, Oslo.	2021-
•	Honor Board, Pittsburgh Parks Conservancy	2022-
•	Advisory Board, Arts Excursions Unlimited, Hazelwood	2022-
•	Advisory Board, Carnegie Corporation Ethics & AI	2020-
•	Steering Committee, Collaboratory Against Hate	2020-
•	Drexel University Constellation Prize, Shenango Channel	2020
•	itDF Advisory Board for Europe	2020-
•	Board, International Advisory Group of Ethics of AI in Education	2019-
•	Schools that Can, National Advisory Board	2019-
•	Global Artificial Intelligence Council, World Economic Forum	2019-
•	Fellow, Hastings Center	2019-
•	Juror, Heinz Awards	2018-2022
•	Advisory Board, Robo Global	2018-
•	Global Future Council, New Economic Agenda, WEF	2018-2021
•	Clean Water Action Dewey Award, CREATE Lab	2017
•	WEF Core Working Group, Digital Economy Research Agenda	2017-2020

- World Economic Forum Global Steward 2017-2020
- Member, New Vision for Agriculture Transformation Leaders Network (WEF) 2016-2017
- Global Future Council on the Future of AI and Robotics, World Econ Forum 2016-2018
- IEEE Global Initiative for Ethical Considerations in the Design of Autonomous Systems, Committee Appointee 2016
- Senior Advisor, The Future Society, Harvard Kennedy School 2016
- Global Innovation Council, Varkey Foundation 2016
- Executive Board, Society for Responsible Robotics 2016
- Trustee, Claude Worthington Benedum Foundation 2015-
- Chair of the Board of Directors, Southwestern PA EHP 2015-2022
- Guest Editor, Special Issue on Educational Robotics, IEEE-RAM 2015
- Webby Award, GigaPan Time Machine with Time Magazine 2014
- Alan Perlis Inaugural Award for Creativity 2014
- Advisory Board, TUM CREATE, Singapore 2014
- Inductee, June Harless Hall of Fame (West Virginia) 2013
- Invited Panelist, Robotics by Invitation (Switzerland) 2013
- Invited Reviewer, NASA 2013
- Invited Organizer, Medicine X, Stanford University 2012
- Delegate, Education Nation 2012
- Advisory Committee, TUM CREATE Singapore (National Research Fdn.) 2012-2014
- Carnegie Science Center Catalyst Award 2012
- Visiting Professor, Science Communication Unit, UWE, Bristol, UK 2011
- Creative Technology Network Advisory Board, founding member 2011-2012
- PennFutures Sustainability Award, ChargeCar Project 2011
- Carnegie Science Center Catalyst honorable mention 2011
- Advisory Board, Pgh Neighborhood and Community Information System 2010-2011
- NASA/Ames Honor Award for GigaPan Project 2010
- Award of Honor, CMU Steinbrenner Institute, Media Fellowship Award 2010
- Fred Rogers Center Task Force Appointee, St. Vincent College 2010
- Program Committee, First Symposium on Educational Advances in AI 2010
- Kavli Fellow, National Academy of Sciences 2009
- Kidsburgh Microsite Editorial Advisory Board 2009-2010
- American Publishers Award for Excellence (*Springer Handbook of Robotics*) 2009
- Public Art Committee (Carnegie Mellon University) 2009-2010
- Advisory Board, Studio for Creative Inquiry 2009
- Advisory Board, AMiRE Symposium 2009-
- Advisory Board, International Robotics Education Forum 2008-2009
- Board of Directors, Pittsburgh Parks Conservancy 2008-2015
- Advisory Board, Carnegie Science Center RoboWorld 2007-2008
- Advisory Board, IPRE (Georgia Tech, Bryn Mawr, Microsoft) 2008 -
- Grable Foundation Community Cabinet 2007 -
- Grable 'Children and Multimedia' Committee 2007
- Elected Who's Who in Engineering 2007
- Executive Committee, FIRST Roboburgh 2007
- Heinz Endowments 3rd Age City Team 2007
- Senior Program Committee, AAI 2007 2007
- Scientific Advisory Board, Polimetrica Publishing House (Italy) 2006
- NASA/Ames Honor Award (Global Connection Project) 2006
- Tech Museum Economic Development Award (Global Connection Project) 2006
- Senior Program Committee, AAI 2006 2006
- Advisory Board appointee, Cogito.org (Johns Hopkins University) 2005-
- Editorial Board member, Journal of Artificial Intelligence Research 2005-2008
- Robotics Lead, NASA/Ames Research Center (GS15-10 civil servant) 2004-2005

- Principal Scientist, Witness Systems, Inc. 2005-2007
- Invited Member, Technical Committee, I-SAIRAS Robotics & Automation (US) 2005
- Appointed Member of US committee, IEEE RAS Industrial Activities Board 2004
- Adjunct Associate Professor, UC Santa Cruz 2004
- Educational Robotics appointee, WTEC Workshop on US Robotics baseline 2004
- Review Board appt, Rover Technology Office, NASA Mars Technology Program 2004-2005
- Elected to AAAI Executive Council April 2004 2004-2007
- Robot Hall of Fame Jury Appointee 2004
- UC Santa Cruz CE Advisory Board Appointee 2004
- Oklahoma Scholar, OSLEP Program 2004
- Reviewer, Swiss National Science Foundation 2004
- Reviewer, Canada Foundation for Innovation Grants 2004
- Chief Scientist, Mobot Robotics 2004-
- Reviewer, European Commission on Future and Emerging Technologies 2003
- Reviewer, Portuguese Science and Technology Foundation 2003
- Reviewer, NASA Intelligent Systems / Automated Reasoning programs 2003
- Guest Editor, Robotics and Autonomous Systems 42 (3-4) 2003
- Review Board member, NASA Autonomy Infusion Working Group 2002
- Director, Robot Education Lab, CMU 2002-
- IAAI Deployed Application Award (BP Scheduling System) 2002
- Invited Visiting Professor, EPFL, Lausanne, Switzerland 2001
- Head, Robotics Institute Master's Program 2001-
- Herbert A. Simon Award for Teaching Excellence in Computer Science 2000
- Invited Reviewer, Portuguese Science and Technology Foundation 2000
- Best Paper in Vision, IEEE Conference on Robotics and Automation 2000
- Subcommittee Chair, SCS Curriculum Committee 2000
- Guest Editor, *Autonomous Robots* 9(1) 2000
- Invited Visiting Professor, EPFL, Lausanne, Switzerland 2000
- Second Place, Event 1 of the AAAI 1999 National Robot Competition 1999
- Invited External Reviewer, Autonomy & Information Management System, NASA 1998
- Editorial Board, Autonomous Robots Special Issue on Integrating Robotics 1998
- Chief Scientist, Blue Pumpkin Software, Inc. 1997-2005
- Robot Contest Advisory Board, The Tech Museum of Innovation 1995-1997
- First Place, Event 1 of the AAAI 1994 National Robot Competition 1994
- First Place, Event 1 of the AAAI 1993 National Robot Competition 1993

Invited Speeches and Authorships

- Keynote, CIC Presidents of Independent Colleges 2024
- Keynote, PAIS Independent School Heads 2023
- Keynote, Penn State Education Vanguard 2023
- Invited Speaker, LGIM / London 2023
- Invited Speaker, UAE Department of Education 2023
- Invited Lecturer, University of Wales Atlantic College 2023
- Invited Speaker, Sustainable Development U.N. New York 2023
- Invited Speaker, ICERM Brown University 2023
- Invited Speaker World Economic Forum 2023
- Geneva Science and Diplomacy Anticipator, Invited Speaker 2023
- VIROS Symposium, Oslo, Norway, Invited Speaker 2022
- ASTC Conference, CEO session, Invited Speaker 2022
- Invited Moderator, West Virginia Focus Forward Conference 2022
- Invited Speaker, Schools that Can 2021
- Invited Speaker, Girona Maker Faire, Evolving Humanity with Robotics 2020

- Chautauqua Institute Speaker 2020
- Invited Keynote, Morgan Stanley CIO Forum, Chicago 2019
- Invited Speaker, World Economic Forum SDIS, New York 2019
- Invited Speaker, Hastings Center Fellows Conference 2019
- Invited Speaker, G7 Global Partnership on AI, Paris 2019
- Invited Speaker, Global UBS CIO Conference 2019
- Invited Keynote, Heinz Endowments Trustee meeting 2019
- Invited Keynote, Council of Independent Colleges Chief Academic Officers 2019
- Invited Keynote, Legal and General Investment Conference, London 2019
- Invited Speaker, World Economic Forum, Davos 2019
- Global Future Council on the New Economic Agenda, Dubai 2018
- Invited Speaker, Morgan Stanley Partners Summit, San Diego 2018
- Invited Keynote, JPMorgan Chase Security Summit, Boston 2018
- Invited Speaker, World Economic Forum, New York City 2018
- Invited Keynote, JPMorgan CEO Summit 2018
- Invited Keynote, Indigo Boston 2018
- Invited Keynote, JPMC CEO summit 2018
- Invited Speaker, World Economic Forum, Davos 2018
- Invited Keynote, JP Morgan Chase Global Voices 2017
- Invited Keynote, JP Morgan Chase headquarters 2017
- Invited Speaker, World Economic Forum, AMNC, Dalian, China 2017
- Invited Speaker, World Economic Forum ISM, Presidio 2017
- Invited Speaker, National Academy of Sciences 2017
- Invited Keynote, STEAM Leadership Conference 2017
- Invited Speaker, South by Southwest 2017
- Invited Speaker, Yale University 2017
- Invited Speaker, Carnegie Foundation 2017
- Invited Speaker, Davos World Economic Forum 2017
- Invited Speaker, Hastings Center Trustees, The Century Club 2016
- Invited Keynote, ELS Social Robots, New Friends, Barcelona 2016
- Carol Brown University Lecture, Carnegie Mellon 2016
- Invited Speaker, Global Education and Skills Conference, Dubai 2016
- Invited Speaker, MIT Tech Conference 2016
- Invited Speaker, Davos World Economic Forum 2016
- Invited Speaker, Heinz Endowments Board of Trustees Meeting 2015
- Invited Speaker, Grantmakers for Education 2015
- Invited Attendee, White House Astronomy Night 2015
- Invited Speaker, Annual Meeting of New Champions, Summer Davos 2015
- Invited Keynote, US State Department Fulbright Seminar 2015
- Invited Speaker, New America Foundation National Conference 2015
- Invited Keynote, West Virginia EdTech 2015
- Invited Keynote, Brown University 2015
- Invited Keynote Speaker, HRI 2015
- Invited Speaker, South by SouthWest 2015
- Invited Speaker, Davos World Economic Forum 2015
- Invited Keynote, PAEYC 2014 2014
- Invited Keynote, West Virginia Technology Conference 2014
- Invited Bovay University Lecture, Cornell University 2014
- Invited Public Speaker, New America Foundation National Stage 2014
- Invited Keynote, Robo-Philosophy 2014, Denmark 2014
- Invited Speaker, West Virginia Board of Education, State Capitol 2013
- Invited Keynote, PAEYC Unconference 2013
- Invited Speaker, Clarkson University Speaker Series 2013

- Invited Speaker, HEFN, Washington DC 2013
- Invited Keynote, PAEYC Unconference 2013
- Invited Speaker, Robotic Weapons Symposium, New York City 2013
- Invited Keynote, Design Education, Philadelphia 2013
- Invited Speech, Moscow Urban Design, Strelka Institute 2013
- Invited Speech, London Science Museum 2011
- Invited Presentation, King's College London 2011
- Invited Debate, Imperial College, London 2011
- Invited Keynote, Calgary Council on Advanced Technologies 2011
- Invited Panelist, PennFutures Conference on a Cleaner Future 2011
- Keynote Speaker, International Conf. on Computational Photography 2011
- Keynote speaker, Technical Association of the Graphic Arts Conference 2011
- Invited Speaker, UC Santa Barbara Institute for Energy Efficiency 2011
- Invited Speaker, Bosch Stuttgart 2011
- Invited Speaker, CRA Conference at Snowbird (for deans & dept. heads) 2010
- Invited Organizer, UN Planning Forum for Technology for Developing World 2010
- Invited Moderator, Fred Rogers National Conference on technology 2010
- Invited Speaker, Robotics and Ethics, HRI Osaka 2010
- Keynote speaker, Ellis School 2010
- Invited Speaker, Sprout Fund Making Sparks program 2009
- Invited Attendee, Kavli Frontiers National Academy of Sciences 2009
- Invited Speaker, Presidential Lecture Series, Oklahoma University 2009
- Invited Speaker, University of Pittsburgh Philanthropy Forum 2009
- Invited Speaker, Bournemouth University Public Lecture (Bournemouth, UK) 2009
- Invited Speaker, United Nations International Conference on Education 2008
- Invited Speaker, Moderator, Fred Rogers Center Briefing on Youth & New Media 2008
- Invited Speaker, Digital Imagers Group 2008 2008
- Invited Keynote, AAAI Spring Symposium on Educational Robotics 2008
- Invited Speaker, Inaugural Speech of IEEE Santa Clara Chapter 2007
- Invited Keynote, PERMiS (NIST) 2007
- Invited Keynote, AMIRE 2007 (Buenos Aires, Argentina) 2007
- Invited Speaker, PUGWash 2007 (Pittsburgh, PA) 2007
- Invited Speaker, The World Affairs Council, San Francisco, CA 2006
- Nature Science Foo Camp, Mountain View, CA 2006
- Invited GRASP lab speaker, U. Penn 2006
- Invited Keynote Speaker, ROMAN 2006 (England) 2006
- Invited Plenary Speaker, AMC 2006 (Istanbul) 2006
- Invited Speaker, Boeing Distinguished Researcher and Scholar Seminar 2005
- Invited Speaker, USC Robotics Colloquium 2005
- Invited Speaker, Stanford Work, Technology, Organization Colloquium 2005
- Invited Speaker, ICRA Workshop on Multi-Robot Systems 2005
- Invited Contributor, Oxford Encyclopedia of Science, Technology and Society 2004
- Invited Author, Educational Robotics chapter, Handbook of Robotics (Sp-Verlag) 2004-2005
- Invited Lecture Series, Winter School on Humanoid Robotics (Vision interaction) 2004
- Invited Speaker, ICRA Workshop on Educational Robotics 2004
- Invited Speaker, AAAI Symposium on Educational Robotics 2004
- Invited Speaker, CES IEEE Round Table on Robotics 2004
- Invited Speaker, SUNY Buffalo Media Arts 2003
- Invited Speaker, Workshop on Social Studies of Social Robotics 2003
- Invited Speaker, Evolution Robotics Advisory Board 2003
- Invited Speaker, Intel Xscale Workshop, Portland 2002
- Invited Speaker, Asilomar Microcomputer Workshop 2001, 2002
- Invited Speaker, Performance Optimization in Call Centers 2000

- Invited Speaker, Tomorrow's Technology Today 2000 2000
- Invited Speaker, Stanford Broad Area Colloquium in CS 2000
- Invited Speaker, ICRA Workshop on Personal Robotics 2000
- Invited Lecture Series, XIII Congreso Chileno de Ingenieria Electrica 1999
- Invited Speaker, AI Seminar Series at the NCARAI (NRL) 1998
- Invited Panelist, AAAI Workshop on the Robot Contest 1998
- Invited Speaker, Central Atlantic Orientation and Mobility Conference 1997

Patents

- "Proactive building air quality management," US patent 11,384,950
- "Optical-particle sensor head," US patent 10,935,480
- "Low energy ultrafine particle detector," US patent 10,801,940
- "Data fusion for personal air pollution exposure," US patent 10,139,384
- "Home air quality analysis and reporting," US patent 10,222,360
- "Low energy ultrafine particle detector," US patent 10,801,940
- "Group calibration of environmental sensors," US Patent 10,054,534
- "Air Quality Sensor," US Patent 9,857,301
- "System and Method for Complex Schedule Generation," US Patent 7,634,422
- "Method and System for concurrent error identification in resource scheduling," US 7,281,173
- "Resilient Leg Design for Hopping, Running and Walking Machines," US Patent 7,270,589
- "System and Method for Complex Schedule Generation," US Patent 7,254,546
- "System and Method for Complex Schedule Generation," US Patent 7,155,399
- "Method and system for concurrent error identification in resource scheduling," US Patent 6,959,405
- "Method and Apparatus for Multi-Contact Scheduling," US Patent 6,952,732
- "Socially Interactive Autonomous Robot (2)," US Patent 6,760,647
- "Energy storage device used in locomotion machine," US Patent 6,558,297
- "Socially Interactive Autonomous Robot," US Patent 6,539,284
- "Agent scheduling system and method having improved post-processing step," US Patent 6,278,978
- "Depth categorization for depth recovery of dynamic scenes," US Patent 5,793,900
- "Deformable and Elastic Tensile-Integrity Structure," US Patent 5,688,604

Other Clients

- Blue Pumpkin Software *Sunnyvale*; Chief Scientist & Founder 1996 - 2005
- Hyperbot, Inc. *Los Altos*; Advisor 1996 - 1998
- Redzone Robotics *Pittsburgh*; Consultant 1997
- Mobot, Inc. *Pittsburgh*; Chief Scientist 1998 - 2000
- Cye Robotics (Aethon, Inc.); Consultant 1998 - 1999
- MGA Entertainment *Los Angeles*; Consultant 1999 - 2000
- Proctor & Gamble *Cincinnati*; Consultant 1999 - 2001
- AT Sciences *Pittsburgh*; Consultant 2001 - 2009
- Mobot Robotics, *Portland*; Chief Scientist 2002 - present
- Witness Systems, *Atlanta*; Principal Scientist 2005 - 2007
- Intel Research; Consultant 2006
- Robodynamics; Advisory Board 2008 - present
- RoBlocks; Advisory Board 2009 - present
- GigaPan LLC; Founder 2009 - 2015
- Wizbots, Inc; Advisory Board 2010 - present
- DeepLocal 2011
- Stroock & Stroock & Lavan 2011- 2013
- XpertUniverse 2013 - present
- Expert for International Trade Commission case, Morgan Lewis 2015
- Airviz, Inc. President & CEO 2015 - present

- Expert for ITC case, Finnegan et al. LLP 2016 – present
- Expert for LeadFactors LLP 2020
- Expert for PVLaw, Fanuc Corporation 2021

Publications

Journals

“Empowering Local Communities Using Artificial Intelligence,” Hsu, Huang, Verma, Mauri, Nourbakhsh, Bozzon. *Patterns Journal*. Elsevier. Vol. 3, Issue 3, 2022.

“AI Ethics: A Call for Responsibility,” I. Nourbakhsh. *Communications of the ACM*. Sept 2021, Vol. 64, No. 9.

“Smell Pittsburgh: Engaging Community Citizen Science for Air Quality,” Hsu, Cross, Dille, Tasota, Dias, Sargent, Ting-Hao, Nourbakhsh. *ACM Transactions on Interactive Intelligent Systems*, 10(4), 2020.

“Leveraging Tangible Interfaces in Primary School Math: Pilot Testing of the Owlet Math Program,” Hamner, Brewer, Speer, Zito, Nourbakhsh. *International Journal of Child-Computer Interaction*, 2020.

“Teaching Artificial Intelligence and Humanity,” J. Keating, I. Nourbakhsh. *Communications of the ACM*. Vol. 61 No. 2, pp. 29-32. 2018.

“The Neighborhood Networks Project” DiSalvo, C., Nourbakhsh, I., Holstius, D., Akin, A., Louw, M. *Design Issues*. MIT Press, 2012.

“Very High-Resolution Panoramic Photography to Improve Conventional Rangeland Monitoring,” M. Nichols, G. Ruyle and I. Nourbakhsh. *Rangeland Ecological Management* 62:579-582, November 2009.

“Working with a robot: Exploring relationship potential in human-robot systems,” D. Bernstein, K. Crowley, I. Nourbakhsh. *Interaction Studies* Special issue on Psychological Benchmarks of Human-Robot Interaction. pp. 465-482. Volume 8, Issue 3, 2007. John Benjamins Publishing.

“Mapping disaster zones,” I. Nourbakhsh, R. Sargent, A. Wright, K. Cramer, B. McClendon, M. Jones. *Nature (439)* pp. 787-8. Reviewed Commentary. 16 February 2006.

“The Personal Exploration Rover: educational assessment of a robotic exhibit for informal learning venues,” I. Nourbakhsh, E. Hamner, D. Bernstein, K. Crowley, E. Ayoob, M. Lotter, S. Shelly, T. Hsiu, E. Porter, B. Dunlavey, D. Clancy. *International Journal of Engineering Education*, Special Issue: Trends in Robotics Education, Vol. 22, No. 4, pp 777-791, 2006.

“The Robotic Autonomy Mobile Robotics Course: Robot Design, Curriculum Design and Educational Assessment,” I. Nourbakhsh, K. Crowley, A. Bhave, E. Hamner, T. Hsiu, A. Perez-Bergquist, S. Richards, K. Wilkinson. *Autonomous Robots Journal*, 18 (1), January 2005.

“The Smart Wheelchair Component System,” R. Simpson, E. LoPresti, S. Hayashi, I. Nourbakhsh and D. Miller. *Journal of Rehabilitation Research and Development*, 41(3B), May/June 2004.

“The Personal Rover Project: The comprehensive design of a domestic personal robot,” Emily Falcone, Rachel Gockley, Eric Porter and Illah Nourbakhsh. *Robotics and Autonomous Systems*, Special Issue on Socially Interactive Robots, 42(3-4), 2003.

“A Survey of socially interactive robots,” Terry Fong, Illah Nourbakhsh and Kerstin Dautenhahn. *Robotics and Autonomous Systems*, Special Issue on Socially Interactive Robots, 42(3-4), 2003.

“Hybrid Simultaneous Map-Building: A Natural Integration of Topological and Metric,” Nicola Tomatis, Illah Nourbakhsh and Roland Siegwart. *Robotics and Autonomous Systems*. 2003.

“Insect Telepresence: Using robotic tele-embodiment to bring insects face-to-face with humans,” Stacy All and Illah Nourbakhsh. *Autonomous Robots, special issue on Personal Robotics*, 10, pp 149-161. 2000.

“An Affective Mobile Educator with a Full-time Job,” Illah Nourbakhsh, Judith Bobenage, Sebastien Grange, Ron Lutz, Roland Meyer and Alvaro Soto. *Artificial Intelligence Journal*. 114 (1-2), pp. 95-124. October 1999.

"Automatic Mapping of Dynamic Office Environments," Clayton Kunz, Thomas Willeke and Illah Nourbakhsh. *Autonomous Robots Journal*, 7:2, 1999.

"Mobile Robot Obstacle Avoidance via Depth from Focus," Illah Nourbakhsh, David Andre, Carlo Tomasi and Michael Genesereth. *Robotics and Autonomous Systems*, 22:151-158. 1997.

"Assumptive Planning and Execution: a Simple, Working Robot Architecture," Illah Nourbakhsh and Michael Genesereth. *Autonomous Robots Journal*, 3(1), pp. 49-67, 1996.

"Methods and Algorithms for Statistical Analysis of Protein Sequences," Volker Brendel, Philip Bucher, Illah Nourbakhsh, Edwin Blaisdell and Samuel Karlin. *Proceedings of the National Academy of Sciences of the United States of America*, 89(6), 1992.

Books and Chapters

Recoding Relationships. J. Keating and I. Nourbakhsh. In *Writing Futures: Collaborative Algorithmic Autonomous*; Ann Duin, Isabel Pedersen. Springer Nature. In print, 2021.

AI and Humanity. I. Nourbakhsh and J. Keating. MIT Press, 2020.

Rossum's Mimesis. J. Keating and I. Nourbakhsh. In *Cyborg Futures*, 2019.

The Language of the Possible. J. Keating and I. Nourbakhsh. In *Wording Robotics*, Springer, 2019.

Parenting for Technology Futures. I. Nourbakhsh. Amazon Createspace Press, 2015.

The Optimism of Discontinuity. I. Nourbakhsh. Invited essay in *The Singularity Hypothesis: A Scientific and Philosophical Analysis*. E. Amnon, J. Soraker, J. Moor and E. Steinhart, Eds. Springer, 2012.

Robot Futures. I. Nourbakhsh. MIT Press, 2013.

Educational Robotics, I. Nourbakhsh, D. Miller and R. Siegwart. Chapter in *The Robotics Handbook* (Springer-Verlag). Invited author, in process est. 2007.

Astronauts, Robonauts and the Moon. I. Nourbakhsh. Chapter in *Star Wars: Where Science Meets Imagination*. ed. Ed Rodley (Museum of Science, Boston and National Geographic Society). 2005.

Social Robotics, I. Nourbakhsh. Chapter/entry in *The Oxford Encyclopedia of Science, Technology and Society* (Oxford University Press). Invited author, 2005.

Introduction to Autonomous Mobile Robots, R. Siegwart and I. Nourbakhsh. MIT Press. March, 2004.

Dervish. *Artificial Intelligence and Mobile Robots*, Chapter 3. David Kortenkamp, R. Peter Bonasso, and Robin Murphy, eds. AAAI Press/ The MIT Press, 1998.

Interleaving Planning and Execution for Autonomous Robots, Illah Nourbakhsh. Kluwer Academic Publishers, 1997.

Other Publications

“Teaching Ethics by Teaching Ethics Pedagogy,” Victoria Dean, Illah Nourbakhsh. Accepted, SIG-CSE 2022.

“Project RISE: Recognizing Industrial Smoke Emissions,” Hsu et al. In AAAI-2021.

“Smell Pittsburgh: Engaging Community Citizen Science for Air Quality,” Hsu et al. In ACM Transactions on Interactive Intelligent Systems, 2020.

“Smell Pittsburgh: Community-Empowered Mobile Smell Reporting System,” Yen-Chia Hsu, Jennifer Cross, Paul Dille, Michael Tasota, Beatrice Dias, Randy Sargent, Ting-Hao (Kenneth) Huang, and Illah Nourbakhsh. In 24th International Conference on Intelligent User Interfaces (IUI '19), March 17–20, 2019, Marina del Ray, CA, USA. ACM, 2019.

“Community-Empowered Air Quality Monitoring System,” Yen-Chia Hsu, P. Dille, J. Cross, B. Dias, R. Sargent, I. Nourbakhsh. 2017 CHI Conference on Human Factors in Computing Systems (CHI '17) ACM.

“Engineering and Computational Thinking Talent in Middle School Students: a framework for defining and recognizing student affinities,” J. Cross, E. Hamner, L. Zito, I. Nourbakhsh. 2016 IEEE Frontiers in Education Conference.

“Development of an Assessment for Measuring Middle School Student Attitudes towards Robotics Activities,” J. Cross, E. Hamner, L. Zito, I. Nourbakhsh, D. Bernstein. 2016 IEEE Frontiers in Education Conference

Arts & Bots: Application and Outcomes of a Secondary School Robotics Program,” J. Cross, E. Hamner, C. Bartley, I. Nourbakhsh. In Proc. 2015 IEEE Frontiers in Education Conference, El Paso, TX, 2015

“Explorable Visual Analytics, Knowledge Discovery in Large and High-Dimensional Data,” S. Amirpour, M. Lewis, R. Sargent, I. Nourbakhsh. KDD Interactive Data Exploration and Analytics Workshop, NYC, USA 2014.

“Knowledge Discovery in Large and High Dimensional Space,” Saman Amraii, Randy Sargent, I. Nourbakhsh, M. Lewis. 1st PA Spatial Cognition Symposium, Penn State Univ. 2014.

Cross, J., Bartley, C., Hamner, E., & Nourbakhsh, I. (2013) “A Visual Robot-Programming Environment for Multidisciplinary Education” In Proceedings of the 2013 IEEE International Conference on Robotics and Automation, Karlsruhe, Germany.

“Model Predictive Control with Uncertainty in Human Driven Systems,” Alex Styler, Illah Nourbakhsh. AAAI 2013.

“ChargeCar Community Conversions: Practical, Custom Electric Vehicles Now!,” Ben Brown, Chris Bartley, Jennifer Cross, Illah Nourbakhsh. In print, IEVC 2012.

“Designing POMDP Models of Socially Situated Tasks,” Frank Broz, Reid Simmons, Illah Nourbakhsh. RO-MAN 2011.

“Active Management of a Heterogenous Energy Store for Electric Vehicles,” Alex Styler, Gregg Podnar, Paul Dille, Matt Duescher, Christopher Bartley, Illah Nourbakhsh. In print, IEEE FISTS 2011. Vienna, Austria, 2011.

“Designing the Finch: Creating a Robot Aligned to Computer Science Concepts,” Tom Lauwers & Illah Nourbakhsh. Accepted, in print, Educational Advances in Artificial Intelligence, 2010.

“GigaPixels for Science,” Illah Nourbakhsh. Invited robotics column. In *IEEE Robotics and Autonomous Systems*. In print. June 2010.

“A Strategy for Collaborative Outreach: Lessons from the CSBots Project,” Tom Lauwers, Emily Hamner, Illah Nourbakhsh. In *Proceedings of SIGCSE*. March 2010.

“GigaPan Conversations: Diversity and Inclusion in the Community,” Illah Nourbakhsh, Clementina Acedo, Randy Sargent, Christopher Strelbel, Laura Tomokiyo, Carolina Belalcazar. In *Proceedings of International Scientific Conference on Technology for Development*, United Nations, Lausanne, Switzerland 2010.

“Very High Resolution Panoramic Images in Research Based Community Outreach,” Mary Nichols, Jeff Schalaus, George Ruyle, Illah Nourbakhsh. In *Proceedings of the ANREP Rangelands Conference*. Fairbanks, Alaska, 2010.

“Robot Diaries: Creative Technology Fluency for Middle School Girls,” Nourbakhsh, I. Invited educational robotics column. In *IEEE Robotics and Autonomous Systems*. 2009.

“CSbots: Design and Deployment of a Robot Designed for the CS1 Classroom,” Lauwers, T., Nourbakhsh, I. In *Proceedings of SIGCSE 2009*.

“The Neighborhood Networks Projects: A Case Study of Critical Engagement and Creative Expression Through Participatory Design,” DiSalvo, C., Nourbakhsh, I., Holstius, D., Akin, A., Louw, M. In *Proceedings of the 2008 Participatory Design Conference*. Bloomington, Indiana. 2008.

“Planning for Human-Robot Interaction using Time-State Aggregated POMDPs,” Broz, F., Nourbakhsh, I., Simmons, R. In *Proceedings of NCAI AAAI 2008*, Menlo Park, CA.

“Using a Robot Proxy to Create Common Ground in Exploration Tasks,” Stubbs, K., Wettergreen, D., Nourbakhsh, I. In *Proceedings of HRI 2008*, Amsterdam, Netherlands.

“Robot Diaries: Broadening Participation in the Computer Science Pipeline through Social Technical Exploration,” Hamner, E., Lauwers, T., Bernstein, D., Nourbakhsh, I., DiSalvo, C. In *Proceedings of the AAAI Spring Symposium on Using AI to Motivate Greater Participation in Computer Science*. Stanford, California, 2008.

“Robot Diaries interim project report: Development of a technology program for middle school girls,” Hamner, E., Lauwers, T., Bernstein, D., Stubbs, K., Crowley, K. & Nourbakhsh, I. Carnegie Mellon University Technical Report CMU-RI-TR-08-25. 2008.

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