

KARL D. IAGNEMMA

Current Position

Principal Research Scientist
Department of Mechanical Engineering
Massachusetts Institute of Technology
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Education

Massachusetts Institute of Technology, Cambridge, MA
Ph.D., Mechanical Engineering, February 2001
Thesis: *Rough-Terrain Mobile Robot Planning and Control with Application to Planetary Exploration*
Advisor: Prof. Steven Dubowsky
Minor field of study: Fiction writing

Massachusetts Institute of Technology, Cambridge, MA
M.S., Mechanical Engineering, June 1997
Thesis: *Manipulator Identification and Control using a Base-Mounted Force/Torque Sensor*
Advisor: Prof. Steven Dubowsky

University of Dublin, Trinity College, Dublin, Ireland
Curriculum of applied mathematics and English literature

University of Michigan, Ann Arbor, MI
B.S., Mechanical Engineering, *Summa cum laude*, June 1994

Research Interests

Director of the Robotic Mobility Group in the department of mechanical engineering at MIT. Laboratory research focuses on the modeling, design, control, motion planning, and sensing for robotic systems operating in unstructured environments. Specific applications include planetary exploration rovers, unmanned ground vehicles, orbital robotic systems, manipulators and material handling devices, and surgical robotics.

Academic Positions

Principal Research Scientist	1/06 –
Lecturer	7/04 – 7/05
Research Scientist	2/02 – 1/06

Postdoctoral Researcher *2/01 – 2/02*
Graduate Research Assistant *9/95 – 2/01*

Department of Mechanical Engineering
 Massachusetts Institute of Technology, Cambridge, USA

Visiting Researcher *9/06 – 9/07*

Department of Mechanical Engineering
 National Technical University of Athens, Athens, Greece

Visiting Researcher *9/98 – 12/98*

Science and Technology Development Section
 NASA Jet Propulsion Laboratory, Pasadena, USA

Grants and Awards

DURIP: Equipment for UGVs with Omnidirectional Sensing and Mobility

U.S. Army Research Office *\$149k 4/09 – 9/10*
 Principal Investigator

2009 Conference on Field and Service Robotics, FSR '09

U.S. Army Research Office *\$15k 4/08 – 9/09*
 Principal Investigator

SQUISHBot (Soft QUIet SHape-shifting robot)

Defense Advanced Research Projects Agency (DARPA) *\$65k 1/08 – 7/09*
 Co-Investigator, with A. Hosoi (PI), G. McKinley, and M. Culpepper

Self-Supervised Mobility-Based Terrain Classification for Unmanned Ground Vehicles

U.S. Army Research Office *\$870k 9/07 – 9/10*
 Principal Investigator

A Unified Approach to Sensor-Based Terrain Characterization and UGV Mobility Prediction

U.S. Army Research Office *\$425k 9/07 – 9/10*
 Principal Investigator

Efficient Stochastic Mobility Prediction for Mobile Robotic Systems

U.S. Army Research Office *\$425k 9/07 – 9/10*
 Principal Investigator

Mobility-Dependent Motion Planning for High Speed Robotic Vehicles

U.S. Army Research Office *\$125k 9/07 – 9/08*
 Principal Investigator, with E. Frazzoli (Co-I)

Lookahead Control and Sensing for Active Navigation and Hazard Avoidance

Ford Motor Company *\$450k 9/07 – 9/10*
 Principal Investigator

Workshop on Mobility and Control in Challenging Environments

U.S. Army Research Office *\$15k 9/06 – 9/07*
Principal Investigator

Microbots for Large-Scale Planetary Surface and Subsurface Exploration

NASA Institute for Advanced Concepts *\$400k 9/05 – 9/07*
Co-Investigator, with S. Dubowsky (PI) and P. Boston

Navigation and Hazard Avoidance for High Speed Unmanned Ground Vehicles in Rough Terrain

U.S. Army Research Office *\$328k 4/05 – 4/08*
Co-Investigator, with S. Dubowsky (PI)

Reinforcement Learning for Dynamic Vehicle Control

DARPA (with Stanford Univ.) *\$227k 10/04 – 5/06*
Co-Investigator, with S. Dubowsky (PI), S. Thrun, and A. Ng

Multi-Sensor Terrain Classification and Terrain-Adaptive Navigation for Rovers in Very Rough Terrain

NASA Mars Technology Program (with JPL) *\$600k 9/04 – 9/07*
Co-Investigator, with S. Dubowsky (PI), L. Matthies, and D. Helmick

Sensing and Control For Improved Vehicle Stability

Ford Motor Company *\$450k 9/04 – 9/07*
Co-Investigator, with S. Dubowsky (PI)

Model-Based Control of High-Speed Rough-Terrain Robotic Vehicles

DARPA and U.S. Army TARDEC *\$625k 3/01 – 3/05*
Co-Investigator, with S. Dubowsky (PI)

Microbots for Large-Scale Planetary Surface and Subsurface Exploration

NASA Institute for Advanced Concepts *\$75k 10/03 – 4/04*
Co-Investigator, with S. Dubowsky (PI) and P. Boston

On-Line Terrain Characterization and Traversability Assessment for Mars Rovers

NASA Jet Propulsion Laboratory *\$499k 5/01 – 5/04*
Co-Investigator, with S. Dubowsky (PI)

Teaching Experience**Course assistant**

2.007: Design and Manufacturing I
Massachusetts Institute of Technology
Department of Mechanical Engineering

*Spring 1997***Honors and Awards**

Certificate for Outstanding Research Activity, Robotics and *2009*

Mechatronics Division, Japanese Society of Mechanical Engineering	
Best conference paper award, IEEE International Conference on Mechatronics and Automation,	2008
Winner, APEX Grand Award for Writing, for <i>Journal of Field Robotics</i> special issue on the DARPA Grand Challenge	2007
Best paper award bronze medal, 25 th Army Science Conference	2006
Nominee, MacArthur Foundation Fellowship	2005
Chosen as one of the “top 10 innovative young scientists” by <i>Red Herring</i> magazine	2005
Chosen as one of 16 people who “redefined science in 2003” by <i>SEED</i> magazine	2003
National Science Foundation Graduate Research Fellowship	1995-1998
Rotary Foundation International Ambassadorial Scholarship	1995
University of Michigan Distinguished Undergraduate Achievement Commendation (first in class)	1994
Dow Chemical Scholar	1994
General Motors Scholar	1992-1994

Academic Activities

Conference Session Chair or Co-Chair

IEEE/RSJ International Conference on Intelligent Robots and Systems	2008
IEEE International Conference on Robotics and Automation	2007
SPIE Conference on Unmanned Ground Vehicles	2003–

Conference Program Committee Participation

IEEE International Conference on Robotics and Automation	2006
Robotics: Science and Systems	2006–
International Conference on Advanced Robotics	2005
SPIE Conference on Unmanned Systems Technology	2003–

Technical Committee Participation

IEEE Robotics and Automation Society, Space Robotics Technical Committee	2007–
International Society of Terrain-Vehicle Systems, Planetary & Terrestrial Rovers Technical Group	2007–

Workshop and Conference Organization

Co-Organizer, Workshop on the 2007 DARPA Urban Challenge at the 2008 IEEE International Conference on Robotics and Automation, Pasadena, CA	2008
Co-Chair, Conference on Field and Service Robotics, FSR '09, Cambridge, MA	2007–
General Chair, ARO Workshop on Mobility and Control in Challenging Environments, Olin College, Needham MA	2006

Editorial Service

IEEE Transactions on Robotics—Associate Editor	<i>2007–</i>
Journal of Terramechanics—Guest co-Editor, special issue on Robots in Natural Terrain	<i>2007</i>
Journal of Field Robotics—Guest co-Editor, special issue on the 2007 DARPA Urban Challenge	<i>2007–2008</i>
Journal of Field Robotics, Associate Editor	<i>2006–</i>
Journal of Field Robotics—Guest co-Editor, special issue on the 2005 DARPA Grand Challenge	<i>2006–2007</i>

Peer Review—Journal Publications

ASME Journal of Mechanisms and Robotics
 IEEE/ASME Transactions on Mechatronics
 IEEE Transactions on Automation Science and Engineering
 IEEE Transactions on Control Systems Technology
 IEEE Transactions on Robotics
 IEEE Transactions on Systems, Man, and Cybernetics
 International Journal of Robotics and Automation
 International Journal of Robotics Research
 Journal of Autonomous Robots
 Journal of Field Robotics
 Journal of Mechanism and Machine Theory
 Journal of Terramechanics
 Planetary and Space Science
 Robotica
 Vehicle System Dynamics

Peer Review—Conference Proceedings

ASME Dynamic Systems and Control Conference
 ASME Mechanisms and Robotics Conference
 ASME Vibration and Noise Conference
 IEEE Conference on Decision and Control
 IEEE International Conference on Automation Science and Engineering
 IEEE International Conference on Intelligent Robots and Systems
 IEEE International Conference on Multisensor Fusion and Integration for
 Intelligent Systems
 IEEE International Conference on Robotics and Automation
 International Conference on Advanced Robotics
 International Conference on Advances in Robot Kinematics
 Robotics: Science and Systems

Peer Review—Books and Book Proposals

Marshall Cavendish Benchmark Publishers
 Wiley-Interscience Publishers

Peer Review—Proposal Evaluation

American Institute of Biological Sciences
 Austrian Science Fund
 NASA

National Research Foundation of Singapore
University of Nebraska—Lincoln
University of Western Ontario
U.S. Army Medical Research and Materiel Command
U.S. Army Research Office
U.S. Civilian Research and Development Foundation

Academic Affiliations

IEEE
Sigma Xi

Invited Lectures

“Mobile Robots in Challenging Environments: State of the Art and Technical Frontiers,” U.S. Army Tank-Automotive Research, Development, and Engineering Center, September, 2007
“Robotic Terrain Surveying and Probabilistic Mobility Prediction,” U.S. Army Engineer Research and Development Center, July, 2006
“Modeling, Sensing, and Control of Mobile Robots in Challenging Environments,” Army Cold Regions Research and Engineering Laboratory, February, 2006
“Modeling, Analysis, and Sensing Methods for Passenger Vehicle Tripped Rollover,” Ford Motor Company, October, 2005
“Next Generation Space Robotics Research,” Northeastern University, February, 2005
“Navigation and Hazard Avoidance for High-Speed Mobile Robots in Rough Terrain,” University of Nebraska-Lincoln, November, 2004
“Sensing and Control for Tripped Rollover Mitigation,” Ford Motor Company, May, 2004
“Next Generation On-Orbit, Surface, and Sub-Surface Robotic Systems,” NASA/MIT Workshop on Transformational Technologies, December, 2003

Publications

Publication h-index as of March, 2009 (from scholar.google.com): 17.

Theses

Iagnemma, K., *Rough-Terrain Mobile Robot Planning and Control, with Application to Planetary Exploration*, Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, MA, 2001

Iagnemma, K., *Manipulator Identification and Control Using a Base-Mounted Force/Torque Sensor*, Master's Thesis, Massachusetts Institute of Technology, Cambridge, MA, 1997

Books and Monographs

Iagnemma, K., and Dubowsky, S., *Mobile Robots in Rough Terrain: Estimation, Motion Planning, and Control with application to Planetary Rovers*, Springer Tracts in Advanced Robotics (STAR) Series, Volume 12, Springer, June 2004

Edited Volumes

Richter, L., **Iagnemma, K.**, and Shoop, S., (eds), *The Journal of Terramechanics Special Issue on Terrain Interaction for Small Robotic Vehicles*, in press

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *The DARPA Urban Challenge: Autonomous Vehicles in City Traffic*, Springer Tracts in Advanced Robotics (STAR) Series, Springer, to appear, 2009

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *Journal of Field Robotics Special Issue on the DARPA Urban Challenge, Part 3*, Vol. 25, No. 10, October, 2008

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *Journal of Field Robotics Special Issue on the DARPA Urban Challenge, Part 2*, Vol. 25, No. 9, September, 2008

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *Journal of Field Robotics Special Issue on the DARPA Urban Challenge, Part 1*, Vol. 25, No. 8, August, 2008

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.) *The 2005 DARPA Grand Challenge: The Great Robot Race*, Springer Tracts in Advanced Robotics (STAR) Series, Volume 36, Springer, September, 2007

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *Journal of Field Robotics Special Issue on the DARPA Grand Challenge, Part 2*, Vol. 23, No. 9, September, 2006

Winner, APEX Grand Award

Buehler, M., **Iagnemma, K.**, and Singh, S., (eds.), *Journal of Field Robotics Special Issue on the DARPA Grand Challenge, Part 1*, Vol. 23, No. 8, August, 2006

Winner, APEX Grand Award

Refereed Journal Publications

Ishigami, G., Kewlani, G., and **Iagnemma, K.**, “A Statistical Approach to Mobility Prediction for Planetary Surface Exploration Rovers in Uncertain Terrain,” submitted to the *IEEE Robotics and Automation Magazine*

Anderson, S., Peters, S., Pilutti, T., and **Iagnemma, K.**, “An Optimal-Control-Based Framework for Trajectory Planning, Threat Assessment, and Semi-Autonomous Control of Passenger Vehicles in Hazard Avoidance Scenarios,” submitted to the *International Journal of Vehicle Autonomous Systems*

- Udengaard, M., and **Iagnemma, K.**, “Analysis, Design, and Control of an Omnidirectional Mobile Robot in Rough Terrain,” submitted to the *IEEE/ASME Transactions on Mechatronics*
- Richter, L., and **Iagnemma, K.**, “Editorial for the Special Issue on Terrain Interaction for Small Robotic Vehicles,” *Journal of Terramechanics*, in press
- Ward, C., and **Iagnemma, K.**, “Speed Independent Vibration-Based Terrain Classification for Passenger Vehicles,” *Vehicle System Dynamics*, in press
- Peters, S., and **Iagnemma, K.**, “Stability Measurement of High Speed Vehicles on Sloped and Rough Terrain,” *Vehicle System Dynamics*, in press
- Iagnemma, K.**, and Ward, C., “Classification-Based Wheel Slip Detection and Detector Fusion for Mobile Robots on Outdoor Terrain,” *Autonomous Robots*, Vol. 36, No. 1, pp. 33-46, January, 2009
- Halatci, I., Brooks, C., and **Iagnemma, K.**, “Visual and Tactile Terrain Classification and Classifier Fusion for Planetary Exploration Rovers,” *Robotica*, Vol. 26, No. 6, pp. 767-779, Nov 2008
- Buehler, M., and **Iagnemma, K.**, “Editorial for the Special Issue on the DARPA Urban Challenge,” *Journal of Field Robotics*, Vol. 25, Nos. 8, 9, and 10, August/September/October, 2008
- Ward, C., and **Iagnemma, K.**, “A Dynamic Model-Based Wheel Slip Detector for Mobile Robots on Outdoor Terrain,” *IEEE Transactions on Robotics*, Vol. 24, No. 4, pp. 821-831, August, 2008
- Rentschler, M., Farritor, S., **Iagnemma, K.**, “Mechanical Design of Robotic *in vivo* Wheeled Mobility,” *ASME Journal of Mechanical Design*, Vol. 129, No. 10, pp. 1037-1045, October, 2007
- Shimoda, S., Kuroda, Y., **Iagnemma, K.**, “Potential Field Navigation of High Speed Vehicles on Rough Terrain,” *Robotica*, Vol. 25, No. 4, pp 409-424, July 2007
- Rentschler, M., Dumpert, J., Platt, S., **Iagnemma, K.**, Oleynikov, D., Farritor, S., “An *in vivo* Mobile Robot for Surgical Vision and Task Assistance,” *ASME Journal of Medical Devices*, Vol. 1, No. 1, pp. 23-29, March, 2007
- Siddiqi, A., De Weck, O., and **Iagnemma, K.**, “Reconfigurability in Planetary Surface Vehicles: Modeling Approaches and Case Study,” *Journal of the British Interplanetary Society*, Vol. 59, December, 2006
- Buehler, M., and **Iagnemma, K.**, “Editorial for the Special Issue on the DARPA Grand Challenge,” *Journal of Field Robotics*, Vol. 23, Nos. 8 and 9, August/September, 2006
- Brooks, C., **Iagnemma, K.**, and Dubowsky, S., “Visual Wheel Sinkage Measurement for Mobile Robot Mobility Characterization,” *Autonomous Robots*, Volume 21, Number 1, pp. 55-64, August, 2006
- Spenko, M., Kuroda, Y., Dubowsky, S., and **Iagnemma, K.**, “Hazard Avoidance for High Speed Unmanned Ground Vehicles in Rough Terrain,” *Journal of Field Robotics*, Volume 23, No. 5, pp. 311-331, May, 2006

Rentschler, M., Dumpert, J., Platt, S., **Iagnemma, K.**, Oleynikov, D., Farritor, S., “Modeling, Analysis, and Experimental Study of *In Vivo* Wheeled Mobility,” *IEEE Transactions on Robotics*, Volume 22, No. 2, pp. 308-321, April, 2006

Brooks, C., **Iagnemma, K.**, “Vibration-based Terrain Classification for Planetary Exploration Rovers,” *IEEE Transactions on Robotics*, Volume 21, Number 6, pp. 1185-1191, December 2005

Shibly, H., **Iagnemma, K.**, and Dubowsky, S., “An Equivalent Soil Mechanics Formulation for Rigid Wheels in Deformable Terrain, with Application to Planetary Exploration Rovers,” *Journal of Terramechanics*, Volume 42, Number 1, pp. 1-13, January 2005

Iagnemma, K., and Dubowsky, S., “Traction Control of Wheeled Robotic Vehicles with Application to Planetary Rovers,” *International Journal of Robotics Research*, Volume 23, Number 10, pp. 1029-1040, October 2004

Iagnemma, K., Kang, S., Shibly, H., and Dubowsky, S., “On-Line Terrain Parameter Estimation for Planetary Rovers,” *IEEE Transactions on Robotics and Automation*, Volume 20, Number 5, pp. 921-927, October 2004

Iagnemma, K., Rzepniewski, A., Dubowsky, S., and Schenker, P., “Control of Robotic Vehicles with Actively Articulated Suspensions in Rough Terrain,” *Autonomous Robots*, Volume 14, Number 1, pp. 5-16, January 2003

Morel, G., **Iagnemma, K.**, and Dubowsky, S., “The Precise Control of Manipulators Using Base Force/Torque Sensing,” *Automatica: The Journal of the International Federation of Automatic Control*, Volume 36, Number 7, pp. 931-941, 2000

Book Chapters

Iagnemma, K., “Terrain Estimation Methods for Enhanced Autonomous Rover Mobility,” *Intelligence for Space Robotics*, TSI Press, July, 2006

Refereed Conference Proceeding Publications

Anderson, S., Peters, S., Pilutti, T., and **Iagnemma, K.**, “An Optimal-Control-Based Framework for Trajectory Planning, Threat Assessment, and Semi-Autonomous Control of Passenger Vehicles in Hazard Avoidance Scenarios: Experimental Results,” submitted to the *2009 Conference on Field and Service Robots*

Tadakuma, K., Tadakuma, R., Nagatani, K., Yoshida, K., Ming, A., Shimojo, M., and **Iagnemma, K.**, “Basic Running Test of the Cylindrical Tracked Vehicle with Sideways Mobility,” submitted to the *2009 IEEE International Conference on Robots and Systems*

Tadakuma, K., Tadakuma, R., Nagatani, K., Yoshida, K., Ming, A., Shimojo, M., Shimojo, M., and **Iagnemma, K.**, “Throwable Tetrahedral Robot with Transformation Capability,” submitted to the *2009 IEEE International Conference on Robots and Systems*

Kewlani, G., Ishigami, G., and **Iagnemma, K.**, “Stochastic Mobility-based Path Planning in Uncertain Environments,” submitted to the *2009 IEEE International Conference on Robots and Systems*

Ishigami, G., Kewlani, G., and **Iagnemma, K.**, “Statistical Mobility Prediction for Planetary Surface Exploration Rovers in Sloped, Uncertain Terrain,” submitted to the *2009 IEEE International Conference on Robots and Systems*

Kewlani, G., and **Iagnemma, K.**, “A Multi-Element Generalized Polynomial Chaos Approach to Analysis of Mobile Robot Dynamics under Uncertainty,” submitted to the *2009 IEEE International Conference on Robots and Systems*

Brooks, C., and **Iagnemma, K.**, “Visual Detection of Novel Terrain via Two-Class Classification,” *Proceedings of the 24th Annual ACM Symposium on Applied Computing*, 2009

Iagnemma, K., Udengaard, M., Ishigami, G., Spenko, M., Oncu, S., Khan, I., Overholt, J., and Hudus, G., “Design and Development of an Agile, Man Portable Unmanned Ground Vehicle,” *Proceedings of the 26th Annual Army Science Conference*, 2008

Tadakuma, K., Tadakuma, R., Kinoshita, H., Nagatani, K., Yoshida, K., Udengaard, M., and **Iagnemma, K.**, “Mechanical Design of Cylindrical Track for Sideways Motion,” *Proceedings of the IEEE International Conference on Mechatronics and Automation*, 2008

Best conference paper award

Kewlani, G., and **Iagnemma, K.**, “A Stochastic Response Surface Approach to Statistical Prediction of Robotic Mobility,” *Proceedings of the IEEE International Conference on Robots and Systems, IROS '08*, 2008

Peters., S., and **Iagnemma, K.**, “Mobile Robot Path Tracking of Aggressive Maneuvers on Sloped Terrain,” *Proceedings of the IEEE International Conference on Robots and Systems, IROS '08*, 2008

Iagnemma, K., Shimoda, S., and Shiller, Z., “Near-Optimal Navigation of High Speed Mobile Robots on Uneven Terrain,” *Proceedings of the IEEE International Conference on Robots and Systems, IROS '08*, 2008

Tadakuma, K., Tadakuma, R., Nagatani, K., Yoshida, K., and **Iagnemma, K.**, “Crawler Mechanism with Circular Section to Realize a Sideling Motion,” *Proceedings of the IEEE International Conference on Robots and Systems, IROS '08*, 2008

Kewlani, G., and **Iagnemma, K.**, “Mobility Prediction for Unmanned Ground Vehicles in Uncertain Environments,” *Proceedings of the SPIE Conference on Unmanned Systems Technology*, 2008

Udengaard, M., and **Iagnemma, K.**, “Design of a Highly Maneuverable Wheeled Mobile Robot,” *Proceedings of the SPIE Conference on Unmanned Systems Technology*, 2008

Rohde, M., Perlin, V., **Iagnemma, K.**, Lupa, M., Rohde, S., Overholt, J., Fiorani, G., “PointCom: Semi-Autonomous UGV Control with Intuitive

Interface,” *Proceedings of the SPIE Conference on Unmanned Systems Technology*, 2008

Helmick, D., Angelova, A., Matthies, L., Brooks, C., Halatci, I., Dubowsky, S., **Iagnemma, K.**, “Experimental Results from a Terrain Adaptive Navigation System for Planetary Rovers,” *Proceedings of the Ninth International Symposium on Artificial Intelligence, Robotics and Automation in Space, i-SAIRAS*, 2008

Udengaard, M., and **Iagnemma, K.**, “Design of an Omnidirectional Mobile Robot for Rough Terrain,” *Proceedings of the IEEE International Conference on Robotics and Automation*, 2008

Udengaard, M., and **Iagnemma, K.**, “Kinematic Analysis and Control of an Omnidirectional Mobile Robot in Rough Terrain,” *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2007

Halatci, I., Brooks, C., and **Iagnemma, K.**, “Terrain Classification and Multi-Classifer Fusion Using Visual and Tactile Sensing for Planetary Rovers,” *Proceedings of the IEEE Aerospace Conference*, 2007

Brooks, C., and **Iagnemma, K.**, “Self-Supervised Classification for Planetary Rover Terrain Sensing,” *Proceedings of the IEEE Aerospace Conference*, 2007

Ward, C., and **Iagnemma, K.**, “Classification-Based Wheel Slip Detection and Detector Fusion for Outdoor Mobile Robots,” *Proceedings of the IEEE International Conference on Robotics and Automation*, pp. 2730-2735, 2007

Ward, C., and **Iagnemma, K.**, “Model-Based Wheel Slip Detection for Outdoor Mobile Robots,” *Proceedings of the IEEE International Conference on Robotics and Automation*, pp. 2724-2729, 2007

Spenko, M., Overholt, J., and **Iagnemma, K.**, “High Speed Hazard Avoidance for Unmanned Ground Vehicles in Emergency Situations,” *Proceedings of the 25th Annual Army Science Conference*, 2006

Best paper award, Unmanned Vehicles session

Runner-up, best conference paper award

Spenko, M., Dubowsky, S., and **Iagnemma, K.**, “Experimental Validation of High Speed Hazard Avoidance Control for Unmanned Ground Vehicles,” *Proceedings of the 8th International IFAC Symposium on Robot Control, SYROCO*, 2006

Peters, S., and **Iagnemma, K.**, “An Analysis of Rollover Stability Measurement for High-Speed Mobile Robots,” *IEEE International Conference on Robotics and Automation*, pp. 3711-3716, 2006

Rentschler, M., Dumpert, J., Platt, S., Oleynikov, D., Farritor, S., and **Iagnemma, K.**, “Mobile *In Vivo* Biopsy Robot,” *IEEE International Conference on Robotics and Automation*, pp. 4155-4160, 2006

Brooks, C., **Iagnemma, K.**, and Dubowsky, S., “Vibration-based Terrain Analysis for Mobile Robots,” *IEEE International Conference on Robotics and Automation*, pp. 3415-3420, 2005

Shimoda, S., Kuroda, Y., and **Iagnemma, K.**, “Potential Field Navigation of High Speed Vehicles on Rough Terrain,” *IEEE International Conference on Robotics and Automation*, pp. 2828-2833, 2005

Dubowsky, S., **Iagnemma, K.**, Liberatore, S., Lambeth, D., Plante, J. and Boston, P., “A Concept Mission: Microbots for Large-Scale Planetary Surface and Subsurface Exploration,” *Proceedings of the Space Technology and Applications International Forum (STAIF)*, pp. 1449-1459, 2005

Rentschler, M., Dumpert, J., Hadzialic, A., Platt, S., Farritor, S., Oleynikov, D., and **Iagnemma, K.**, “Theoretical and Experimental Analysis of In Vivo Wheeled Mobility,” *Proceedings of the 2004 ASME Design Engineering Technical Conference*, pp. 1241-1249, 2004

Spenko, M., **Iagnemma, K.**, and Dubowsky, S., “High Speed Hazard Avoidance for Mobile Robots in Rough Terrain,” *Proceedings of the 2004 SPIE Conference on Unmanned Ground Vehicles*, pp. 439-450, 2004

Golda, D., **Iagnemma, K.**, and Dubowsky, S., “Probabilistic Modeling and Analysis of High-Speed Rough-Terrain Mobile Robots,” *Proceedings of the IEEE International Conference on Robotics and Automation*, pp. 914-919, 2004

Iagnemma, K., Brooks, C., Dubowsky, S., “Visual, Tactile, and Vibration-Based Terrain Analysis for Planetary Rovers,” *Proceedings of the IEEE Aerospace Conference*, pp. 841-848, 2004

Schenker, P., Huntsberger, T., Pirjanian, Dubowsky, S., **Iagnemma, K.**, Sujan, V., “Rovers for Agile, Intelligent Traverse of Challenging Terrain,” *Proceedings of the 11th International Conference on Advanced Robotics*, pp. 1683-1692, 2003

Iagnemma, K., Kang, S., Brooks, C., and Dubowsky, S., “Multi-Sensor Terrain Estimation for Planetary Rovers,” *Proceedings of the Seventh International Symposium on Artificial Intelligence, Robotics and Automation in Space, i-SAIRAS*, 2003

Iagnemma, K., Golda, D., Spenko, M., and Dubowsky, S., “Experimental Study of High-Speed Rough-Terrain Mobile Robot Models for Reactive Behaviors,” *Proceedings of the Eighth International Symposium on Experimental Robotics, ISER '02*, pp. 654-663, 2002

Iagnemma, K., and Dubowsky, S., “Terrain Estimation for High-Speed Rough-Terrain Autonomous Vehicle Navigation,” *Proceedings of the SPIE Conference on Unmanned Ground Vehicle Technology IV*, pp. 256-266, 2002

Iagnemma, K., Shibly, H., and Dubowsky, S., “On-Line Terrain Parameter Estimation for Planetary Rovers,” *Proceedings of the IEEE International Conference on Robotics and Automation*, pp. 3142-3147, 2002

Schenker, P., Huntsberger, T., Pirjanian, P., Baumgartner, E., Aghazarian, H., Trebi-Ollennu, A., Leger, P., Cheng, Y., Backes, P., Tunstel, E., Dubowsky, S., **Iagnemma, K.**, McKee, G., “Robotic Automation for Space: Planetary Surface Exploration, Terrain-Adaptive Mobility, and Multi-Robot

Cooperative Tasks," *Proceedings of the SPIE Symposium on Intelligent Robots and Computer Vision XX*, Volume 4572, pp. 12-28, 2001

Iagnemma, K., Shibly, H., Rzepniewski, A., and Dubowsky, S., "Planning and Control Algorithms for Enhanced Rough-Terrain Rover Mobility," *Proceedings of the Sixth International Symposium on Artificial Intelligence, Robotics and Automation in Space, i-SAIRAS*, 2001

Schenker, S., Pirjanian, P., Balaram, B., Ali, K., Trebi-Ollennu, A., Huntsberger, T., Aghazarian, H., Kennedy, A., Baumgartner, E., **Iagnemma, K.**, Rzepniewski, A., Dubowsky, S., Leger, P., Apostolopoulos, A., McKee, G., "Reconfigurable Robots for All-Terrain Exploration," *Proceedings of the SPIE Symposium on Sensor Fusion and Decentralized Control*, Volume 4196, pp. 454-468, 2000

Iagnemma, K., Rzepniewski, A., Dubowsky, S., Huntsberger, T., Schenker, P., "Mobile Robot Kinematic Reconfigurability for Rough-Terrain," *Proceedings of the SPIE Symposium on Sensor Fusion and Decentralized Control*, pp. 413-420, 2000

Iagnemma, K., and Dubowsky, S., "Vehicle Wheel-Ground Contact Angle Estimation: with Application to Mobile Robot Traction Control," *7th International Symposium on Advances in Robot Kinematics, ARK '00*, pp.137-146, 2000

Iagnemma, K., and Dubowsky, S., "Mobile Robot Rough-Terrain Control (RTC) for Planetary Exploration," *Proceedings of the 26th ASME Biennial Mechanisms and Robotics Conference, DETC 2000*, pp. 1429-1436, 2000

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Students Supervised or co-Supervised

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Personal Activities

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