

Kasra Mehron Manavi

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EDUCATION

University of New Mexico, Albuquerque, New Mexico USA

Ph.D., Computer Science, Starting August 2012

- Advisor: Dr. Lydia Tapia
- Research in Motion Planning, Robotics, Multi-Agent Systems, and Computational Biology
- Expected Graduation: Spring 2017

Texas A&M University, College Station, Texas USA

M.S., Computer Science, August 2009 - May 2012

- Advisor: Dr. Nancy Amato
- Research in Motion Planning and Parallel Algorithms
- Thesis: “*Medial Axis Local Planner: Local Planning for Medial Axis Roadmaps*”
- 3.6/4.0 GPA

The University of New Mexico, Albuquerque, New Mexico USA

B.S., Computer Science, August 2004 - May 2009

B.S., Applied Mathematics, August 2006 - May 2009

- 3.4/4.0 GPA, Dean’s List, Commencement Speaker

HONORS AND AWARDS

- Best Overall Presentation (Ph.D.), American Indian Science and Engineering Society (AISES) National Conference, 2014
- Program in Interdisciplinary Biological and Biomedical Sciences Fellow, 2013–2015
- Google Scholar, 2009–2011
- Van Dyke Scholar, 2006–2009
- Chief Manuelito Scholar, 2004–2009

RESEARCH EXPERIENCE

University of New Mexico - AMP Research Group, Albuquerque, NM

Graduate Research Assistant

February 2012 to Present

Research in robotic multi-agent simulations to study molecules using motion planning techniques. Designed a Monte Carlo simulation based on molecular geometries to study assembly/aggregation. Biological application focuses on studying molecular aggregation responsible for the human allergy immune response.

Texas A&M University - Parasol Lab, College Station, TX

Graduate Research Assistant

January 2010 to February 2012

Research focused on the motion planning problem, primarily on medial axis motion planning and parallel algorithms for motion planning. Worked on potential energy functions for models of proteins that are used in protein folding simulation and had interests in motion planning in constrained environments.

PROFESSIONAL EXPERIENCE

Navajo Language Renaissance, Flagstaff, AZ

Online Resource Developer

January 2012 to Present

Put up an online Navajo language proficiency exam allowing Navajo students who have no access to Navajo language classes to earn credit for Navajo I and II.

Southwestern Indian Polytechnic Institute, Albuquerque, NM

Mentor/Tutor

August 2007 to May 2009

Worked as a mentor and advisor for their STEM program. Targeted math, fundamental coding skills, basic electronics design and construction. Aided in the transition for Native American students from community college to university.

PNM, Albuquerque, NM

Intern

Summer 2006 and Summer 2007

Worked on document management database software, mainly for document retrieval and storage. Also worked on data retrieval and display using a web interface.

IN PREPERATION Torin Adamson, John Baxter, Kasra Manavi, April Suknot, Bruna Jacobson, Patrick Gage Kelley and Lydia Tapia. Feeling Forces: Haptic Device Quality in a Molecular Docking Game *2016 ACM CHI Conference. In Preperation.*

Nick Malone, Hao-Tien Chiang, Kasra Manavi, Ron Lumia, John Wood and Lydia Tapia. Motion Planning Using Roadmaps That Incorporate Workspace Modeling Errors *IEEE Transactions on Robotics (T-RO). Under Submission.*

JOURNAL PUBLICATIONS [1] Brittany Hoard, Bruna Jacobson, Kasra Manavi and Lydia Tapia. Extending Rule-Based Methods to Model Molecular Geometry and 3D Model Resolution *BMC Systems Biology. To Appear.*

[2] Kasra Manavi, Bruna Jacobson, Brittany Hoard and Lydia Tapia. Influence of Model Resolution on Geometric Simulations of Antibody Aggregation *Robotica* 34(8), pp. 1754-1776.

PEER-REVIEWED CONFERENCE PUBLICATIONS [3] Brittany Hoard, Bruna Jacobson, Kasra Manavi and Lydia Tapia. "Extending Rule-Based Methods to Model Molecular Geometry" In *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*. pp. 587-594, Washington, D.C., USA, November 2015.

[4] Torin Adamson, John Baxter, Kasra Manavi, April Suknot, Bruna Jacobson, Patrick Gage Kelley and Lydia Tapia. "Molecular Tetris: Crowdsourced Molecular Docking Using Path-Planning and Haptic Devices." In *ACM SIGGRAPH Conference on Motion in Games (MIG)*. pp. 133-138, Los Angeles, CA, USA, November 2014.

[5] Nick Malone, Kasra Manavi, John Wood and Lydia Tapia. Construction and Use of Roadmaps That Incorporate Workspace Modeling Errors. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. pp. 1264-1271, Tokyo, Japan, November 2013.

[6] Kasra Manavi, Bridget Wilson and Lydia Tapia. Simulation and Analysis of Antibody Aggregation on Cell Surfaces Using Motion Planning and Graph Analysis. In *ACM Conference on Bioinformatics, Computational Biology and Biomedicine (ACM-BCB)*. pp. 458-465, Orlando, FL, USA, October 2012.

[7] Sam Ade Jacobs, Kasra Manavi, Juan Burgos, Jory Denny, Shawna Thomas and Nancy M. Amato. "A Scalable Method for Parallelizing Sampling-Based Motion Planning Algorithms." In *IEEE International Conference on Robotics and Automation (ICRA)*. pp. 2529-2536, Saint Paul, MN, USA, May 2012.

[8] Sam Rodriguez, Jory Denny, Juan Burgos, Aditya Mahadevan, Kasra Manavi, Luke Murray, Anton Kodochygov, Takis Zourntos and Nancy M. Amato. "Toward realistic pursuit-evasion using a roadmap-based approach." In *IEEE International Conference on Robotics and Automation (ICRA)* pp. 1738-1745, Shanghai, China, May 2011.

PEER-REVIEWED
WORKSHOP
PUBLICATIONS

- [9] Kasra Manavi and Lydia Tapia. “Influence of Model Resolution on Antibody Aggregation Simulations.” In *Proceedings of the Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems (RMMS), Robotics Science and Systems (RSS)*. Berkeley, CA, USA, July 2014.
- [10] Torin Adamson, John Baxter, Kasra Manavi, Bruna Jacobson and Lydia Tapia. “Crowdsourced Molecular Docking Using Path-Planning and Haptic Devices.” In *Proceedings of the Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems (RMMS), Robotics Science and Systems (RSS)*. Berkeley, CA, USA, July 2014.
- [11] Kasra Manavi, Alan Kuntz and Lydia Tapia. “Geometrical Insights into the Process of Antibody Aggregation.” In *Proceedings of the AAAI Workshop on Artificial Intelligence and Robotics Methods in Computational Biology (AIRMCB)*. pp. 26-31, Bellevue, WA, USA, July 2013.

OTHER
PUBLICATIONS

- Kasra Manavi. Medial Axis Local Planner: Local Planning for Medial Axis Roadmaps. Master’s Thesis, Department of Computer Science, Texas A&M University, May 2012.
- Kasra Manavi, Shawna Thomas, Nancy M. Amato. Enhanced Medial Axis Local Planning. Technical Report TR11-004, Parasol Laboratory, Department of Computer Science, Texas A&M University, Oct 2011.
- Sam Ade Jacobs, Juan Burgos, Kasra Manavi, Jory Denny, Shawna Thomas, Nancy M. Amato. A Scalable Method for Parallelizing Sampling-Based Motion Planning Algorithms. Technical Report, TR11-005, Parasol Laboratory, Department of Computer Science, Texas A&M University, Sep 2011.

SELECTED
POSTERS AND
PRESENTATIONS

- Kasra Manavi, Bruna Jacobson, Susan Atlas and Lydia Tapia. “Geometric Sampling Framework for Exploring Kinesin-Microtubule Energetics and Dynamics.” Poster at the *Biophysical Society Annual Meeting (BPS)*, Los Angeles, CA, USA, February 2016. Vol 110, Issue 8, 187.500.
- Bruna Jacobson, Kasra Manavi, Susan Atlas and Lydia Tapia. “Impact of Structural and Dynamical Comoplexity of Kinesin Kinetics.” Poster at the *Biophysical Society Annual Meeting (BPS)*, Baltimore, MD, USA, February 2015. Vol. 108, Issue 2, p138a-139a.
- Bridget Wilson, Avanika Mahajan, Diane Lidke, Chang-Shung Tung, Kasra Manavi, Lydia Tapia, Andrew Bradbury and William Hlavacek. “Structure-function relationships that govern FcεRI signaling by allergens.” Presentation at the *American Association of Immunologists Annual Meeting (IMMUNOLOGY)*, Pittsburgh, PA, USA, May 2014. Journal of Immunology 192.1, Supplement 54-2.
- Kasra Manavi, Alan Kuntz and Lydia Tapia. “Computational Methods for Studying Allergens: Simulation and Analysis of Antibody Aggregation.” Poster at the *American Indian Science and Engineering Society National Conference*, Orlando, FL, USA, November 2014. 1st Place Poster Presentation (Ph.D) and Best Overall Presentation (Ph.D.)
- Daniel Heiber, Lorraine Begay Manavi and Kasra Manavi. “Rosetta Stone and Navajo Language Renaissance: Collaboration for Revitalization.” Presentation at the *Athabaskan / Dene Languages Conference*, Bellingham, WA, USA, August 2012.
- Kasra Manavi, Bridget Wilson and Lydia Tapia. “Simulation and Analysis of Antibody Aggregation on Cell Surfaces Using Motion Planning and Graph Analysis.” Poster at the *NISBRE Student Research Poster Session*, Washington, D.C., USA, June 2012.

Sam Ade Jacobs, Kasra Manavi, Shawna Thomas, Nancy M. Amato. "From Days to Seconds: Scalable Parallel Algorithm for Motion Planning." Poster at the *SC ACM Student Research Competition Poster Session*, Seattle, WA, USA, November 2011.

Sam Ade Jacobs, Kasra Manavi, Shawna Thomas, Nancy M. Amato. "From Days to Seconds: Scalable Parallel Algorithm for Motion Planning." Poster at the *Richard Tapia Celebration of Diversity in Computing Conference*, Washington, D.C., USA, April 2011.

STUDENT
RESEARCH
MENTEES

Undergraduates

- Mr. Elijah Jaffe, East Mountain High School, Summer 2014.
- Ms. Amanda Miner, Sandia Preparatory School, Summer 2014.
Runner-Up: National Center for Women and Information Technology Aspirations in Computing competition 2014.
- Mr. Alan Kuntz, UNM Computer Science Major, Summer 2012 - Spring 2014.
Current Position: PhD Student, Computer Science, UNC Chapel Hill
- Mrs. Erica Lopez, UNM Computer Science Major, Summer 2013.

PROFESSIONAL
AND SERVICE
ACTIVITIES

Student Organizer - RSS Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems, July 2014

CSGSA President - University of New Mexico Computer Science Graduate Student Association, Fall 2013 - Spring 2014

Robotics Demo Organizer - Volunteered at local schools and at the University of New Mexico to run robotic demos, Spring 2013 - Present

Panelist - ACEC Panel Discussion "The Next Generation Engineer", March 2009

Co-Reviewer for Scientific Conferences and Journals, Ongoing

International Journal of Robotics Research, IEEE/RSJ International Conference on Intelligent Robots and Systems, IEEE Transactions on Robotics, International Conference on Robotics and Automation, Journal of Computational Biology

SKILLS

Computer Programming:

- C, C++, Java, Python, Perl, MySQL, MATLAB

MATLAB skill set:

- Linear Algebra, PCA, Nonlinear Numerical Methods, Statistics, Visualization, Machine Learning

Productivity Applications:

- $\text{T}_{\text{E}}\text{X}$ ($\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, $\text{B}^{\text{I}}\text{T}_{\text{E}}\text{X}$), Emacs, most common productivity packages (for Windows, OS X, and Linux platforms)
- Chimera and Pymol (Molecular Modeling / Editing Software)
- Maya and Blender (Modeling / Rendering Software)