

# Jyh-Ming Lien

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## Education

**Ph.D. in Computer Science**, Texas A&M University, USA, December 2006

Ph.D. Topic: *Approximation Convex Decomposition And Its Applications*

Thesis advisor: Nancy M. Amato

**B.S. in Computer Science**, National Cheng-Chi University, Taiwan, June 1999

## Research Interests

Computational geometry, computer graphics and animation, robotics, computational neuroscience

## Professional Experience

**Assistant Professor**, Department of Computer Sciences, George Mason University, Fairfax, August 2007–present

**Term Assistant Professor**, Department of Computer Sciences, George Mason University, Fairfax, January 2007–August 2007

**Postdoctoral Researcher**, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, July 2006–January 2007. Advisor: Ruzena Bajcsy

**Research Assistant**, Department of Computer Science, Texas A&M University, Fall 1999–Summer 2006

- Computational Geometry and its applications in Scientific Computing
  - Approximate Convex Decomposition (ACD) and its applications
  - Brain Mapping Project (collaboration with researchers in Neuroscience)
  - Seismic Ray-Tracing (collaboration with researchers in Geophysics)
- Motion Planning and its applications in Computer Graphics and Animation
  - Addressing practical issues of sampling-based motion planners
  - Motion planning for deformable objects
  - Roadmap-based flocking & other group behaviors
  - Developing visualization and authoring tools for motion planning
  - Texas A&M Campus Navigator Project
- Portable remote diagnostic information and telemedicine system

**Teaching Assistant**, Department of Computer Science, Texas A&M University, Fall 2000

**Undergraduate Research Assistant**, Department of Computer Science, National Cheng-Chi University, Taiwan, Spring 1998–Summer 1999. Undergraduate research advisor: Tsai-Yen Li

- Research topic: Virtual tour guide using motion planning techniques

## Publications in Refereed Journals and Conferences

- [1] Jyh-Ming Lien. “Point-Based Minkowski Sum Boundary”, *Proceedings of the Pacific Conference on Computer Graphics and Applications (Pacific Graphics)*, Maui, Hawaii, Nov. 2007, to appear.
- [2] Jyh-Ming Lien and Ruzena Bajcsy. “Skeleton-Based Compression of 3-D Tele-Immersion Data”, *Proceedings of the ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC)*, Vienna, Austria, Sep. 2007, to appear.
- [3] Jyh-Ming Lien. ”Approximate Star-Shaped Decomposition of Point Set Data”, *Proceedings of the IEEE/Eurographics Symposium on Point Based Graphics (PBG)*, Prague, Czech Republic, Sep. 2007, to appear.
- [4] Samuel Rodriguez, Jyh-Ming Lien, and Nancy Amato. “A Framework for Planning Motion in Environments with Moving Obstacles”, *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Diego, Oct 2007, to appear.
- [5] Jyh-Ming Lien and Nancy M. Amato. “Approximate Convex Decomposition of Polyhedra”, *Proceedings of the ACM Symposium on Solid and Physical Modeling (SPM)*, Beijing, China, June 2007, pp. 121–131. (Back cover image) **Invited for journal re-publication in a special issue of COMPUTER AIDED GEOMETRIC DESIGN (CAGD)**.
- [6] Dawen Xie, Marco A. Morales A., Roger Pearce, Shawna Thomas, Jyh-Ming Lien and Nancy M. Amato. “Incremental Map Generation (IMG)”, *Proceedings of the Workshop on Algorithmic Foundations of Robotics (WAFR)*, New York City, July, 2006.
- [7] Jyh-Ming Lien, John Keyser, and Nancy M. Amato. “Simultaneous Shape Decomposition and Skeletonization”, *Proceedings of the ACM Symposium on Solid and Physical Modeling (SPM)*, Cardiff, UK, June 2006, pp. 219–228.
- [8] Aimée Vargas, Jyh-Ming Lien and Nancy M. Amato. “VIZMO++: a Visualization, Authoring, and Educational Tool for Motion Planning”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Orlando, May 2006, pp. 727–732.
- [9] Samuel Rodríguez, Jyh-Ming Lien, Nancy M. Amato. “Planning Motion in Completely Deformable Environments”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Orlando, May 2006, pp. 2466–2471.
- [10] Samuel Rodríguez, Xinyu Tang, Jyh-Ming Lien, Nancy M. Amato. “An Obstacle-based Rapidly-exploring random tree (OBRRT)”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Orlando, May 2006, pp. 895–900.
- [11] Jyh-Ming Lien and Nancy M. Amato. “Approximate Convex Decomposition for Polygons”, *Computational Geometry: Theory & Applications*, pp. 100–123. **Invited submission to special issue featuring selected papers from the 20th Annual ACM Symposium on Computational Geometry 2004.** (Journal version of [14])
- [12] Jyh-Ming Lien, Samuel Rodríguez, Jean-Phillipe Malric and Nancy M. Amato. “Shepherd-ing Behaviors with Multiple Shepherds”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain, April 2005, pp. 3413–3418.
- [13] O. Burchan Bayazit, Jyh-Ming Lien and Nancy M. Amato. “Swarming Behavior Using Probabilistic Roadmap Techniques”, *Proceedings of the International Workshop Swarm Robotics (SAB’04)*, Santa Monica, July 2004, pp. 112–125. *Lecture Notes in Computer Science*, Jan 2005, 3342/2005:112-125.

- [14] Jyh-Ming Lien and Nancy M. Amato. “Approximate Convex Decomposition for Polygons”, *Proceedings of the 20th Annual ACM Symposium on Computational Geometry (SoCG’04)*, New York, June 2004, pp. 17–26.
- [15] Jyh-Ming Lien, O. Burchan Bayazit, Ross T. Sowell, Samuel Rodríguez, and Nancy M. Amato. “Shepherding Behaviors”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, New Orleans, April 2004, pp. 4159–4164.
- [16] Jyh-Ming Lien, Shawna L. Thomas, and Nancy M. Amato. “A general framework for sampling on the medial axis of the free space”, *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Taipei, Taiwan, September 2003, pp. 4439–444.
- [17] Jyh-Ming Lien, Marco Morales, and Nancy M. Amato. “Neuron PRM: A Framework for Constructing Cortical Networks”, *Neurocomputing, Volume 52-54, No. 28*, June 2003, pp. 191-197.
- [18] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Better Group Behaviors in Complex Environments with Global Roadmaps”, *Proceedings of the 2002 Artificial Life (ALIFE): The 8th International Conference on the Simulation and Synthesis of Living System.s*, Sydney, Australia, December 2002, pp. 362–370.
- [19] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Better Group Behaviors using Rule-Based Roadmaps”, *Proceedings of the Workshop on Algorithmic Foundations of Robotics (WAFR)*, Nice, France, December 2002, pp. 95–111.
- [20] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Roadmap-Based Flocking for Complex Environments”, *Proceedings of the 2002 Pacific Graphics (PG)*, Beijing, China, October 2002, pp. 104–113.
- [21] O. Burchan Bayazit, Jyh-Ming Lien, Nancy M. Amato, “Probabilistic Roadmap Motion Planning for Deformable Objects”, *Proceedings of the 2002 IEEE International Conference on Robotics and Automation (ICRA)*, Washington DC, May 2002, pp. 2126–2133.
- [22] Tsai-Yen Li, Jyh-Ming Lien, Shih-Yen Chiu, and Tzong-Hann Yu, “Automatically Generating Virtual Guided Tours”, *Proceedings of the Computer Animation ’99 Conference (CA’99)*, Geneva, Switzerland, May 1999, pp. 99–106.

## Unrefereed Publications, Tech. Reports and Posters

- [23] S. Rodriguez, R. Salazar, N. M. Amato, O. B. Bayazit, and J.-M. Lien. “Roadmap-Based Group Behaviors”, *Proceedings of the RSS Workshop on Algorithmic Equivalences Between Biological and Robotic Swarms*, Atlanta, June 2007, to appear.
- [24] Jyh-Ming Lien and Nancy M. Amato. “Polyhedron Realization using Convex Hull Projection”, *Technical Report TR05-016*, Parasol Lab., Dept. of Computer Science, December 2005.
- [25] Jyh-Ming Lien, Samuel Rodríguez, Xinyu Tang, John Maffei, Daniel Corlette, Arnaud Masciotra, and Nancy M. Amato. “Composable Group Behaviors”, *Technical Report TR05-006*, Parasol Lab., Dept. of Computer Science, September 2005.
- [26] Aimée Vargas, Jyh-Ming Lien, Marco A. Morales A., Samuel Rodríguez, and Nancy M. Amato. “User-Guided Path Planning”, *Technical Report TR05-011*, Parasol Lab., Dept. of Computer Science, September 2005.

- [27] Jyh-Ming Lien and Nancy M. Amato. “Approximate Convex Decomposition”, *Proceedings of the 20th Annual ACM Symposium on Computational Geometry (SoCG’04)*, New York, June 2004, pp. 457–458. Video Abstract.
- [28] Jyh-Ming Lien and Nancy M. Amato. “Approximate Convex Decomposition”, *Technical Report TR03-001*, Parasol Lab., Dept. of Computer Science, January 2003.
- [29] Jyh-Charn Liu, M. Freckleton, Jyh-Ming Lien, and Di Wu. “On the Portable Remote Diagnostic Information and Telemedicine System (PoRDITS)”, *Proceedings of the 13th IEEE Symposium on Computer-Based Medical Systems (CBMS’00)*, Houston, June 2000, pp. 33-35.

## Professional Presentations

(in addition to regular conference talks)

- “Simultaneous Shape Decomposition and Skeletonization Using Approximate Convex Decomposition”
  - Parasol Seminar, Texas A&M University, September 2005
  - Texgraph conference, College Station, Texas, May 2005
- “Approximate Convex Decomposition”
  - Institute of Information Science, Academia Sinica, Taiwan, March 2005
  - Department of Computer Science, National Cheng-Chi University, Taiwan, March 2005
  - Parasol Seminar, Texas A&M University, February 2005
  - Physical and Biological Computing Group seminar, Rice University, December 2004
  - SIGGRAPH Poster Session, Los Angeles, August 2004
  - Poster presented at Student Research Week, March 2004
- “Neuron PRM: A Framework for Constructing Cortical Networks”
  - Brain Networks Laboratory, Texas A&M University, February 2004
  - Poster presented at the Annual Computational Neuroscience Meeting (CNS), Chicago, July 2002

## Honors and Awards

- NSF Travel Grant, IEEE International Conference on Robotics and Automation (ICRA), September 2003, Taipei, Taiwan
- Student Research Week, Second Place in Engineering (University-wide annual award recognizing research excellence), Texas A&M University, 2004
- Graduate Teaching Academy (GTA) fellow, GTA certificate of completion, Texas A&M University, December 2005
- Computing Research Association (CRA) Travel Grant, CRA Academic Careers Workshop, Washington, DC, February 2006

## Student Research Mentoring

- Mr. Sandhu S. Bharatinder, CE major, Fall 2001–Summer 2003  
University Undergraduate Research Fellow, Thesis May 2003
- Mr. Ross Sowell, Junior CS major, University of the South, Summer 2003.  
Currently Ph.D. student at Washington University in St. Louis
- Mr. Jean-Phillipe Malric, Junior CE major, IMERIR, University of Perpignan, France, Summer 2004

Mr. Arnaud Masciotra, Junior CE major, IMERIR, University of Perpignan, France, Summer 2004

Ms. Aimée Vargas, CS M.S., Fall 2001– Fall 2005

Mr. Samuel Rodríguez, CS Ph.D, Fall 2003–present

Mr. Roger Pearce, CE major, Fall 2001–Summer 2003

University Undergraduate Research Fellow, Thesis May 2003 CS Ph.D, Fall 2003–present

## **Professional Activities**

Reviewer, for journals (IEEE Transactions on Robotics and Automation, International Journal of Robotics Research, Algorithmica), and conferences (SIGGRAPH, IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS))

Member, Institute of Electrical and Electronics Engineers (IEEE) Robotics and Automation Society, 2002–present

Student Member, Association for Computing Machinery (ACM)

Student Member, Society for Industrial and Applied Mathematics (SIAM)

## References

Available upon request