Hao-Tien (Lewis) Chiang

CONTACT INFORMATION

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RESEARCH INTERESTS

Motion Planning, Robotics, Machine Learning, Artificial Intelligence

EDUCATION

University of New Mexico, Albuquerque, New Mexico, USA

Ph.D., Computer Science, expected 2019

- Advisor: Lydia E. Tapia

University of New Mexico, Albuquerque, New Mexico, USA

M.S., Physics, December, 2014

National Taiwan Univeristy, Taipei, Taiwan

B.S., Atmospheric Sciences, June, 2009

PUBLICATIONS IN REFEREED JOURNALS

[1] Hao-Tien (Lewis) Chiang and Lydia Tapia, "COLREG-RRT: A RRT-based COLREGS-Compliant Motion Planner for Surface Vehicle Navigation," *Robotics and Automation Letters*, In Press, 2018.

[2] Nicholas Malone, Hao-Tien (Lewis) Chiang, Kendra Lesser, Meeko Oishi, and Lydia Tapia, "Hybrid Dynamic Moving Obstacle Avoidance Using a Stochastic Reachable Set-Based Potential Field," *IEEE Transactions on Robotics*, 33(5), 1124–1138, 2017.

[3] Hao-Tien (Lewis) Chiang, Guanglei Xu and Rolando Somma, "Improved bounds for eigenpath traversal" *Physical Review A*, 89, No. 1(012314), 2014.

PUBLICATIONS IN REFEREED CONFERENCES

[4] Hao-Tien (Lewis) Chiang, Baisravan HomChauhudri, Lee Smith and Lydia Tapia."Safety, Challenges, and Performance of Motion Planners in Dynamic Environments." *Proceedings of the International Symposium of Robotics Research (ISRR)*, to appear, Puerto Varas, Chile, 2017.

[5] Torin Adamson, Meeko Oishi, Hao-Tien (Lewis) Chiang, Lydia Tapia , "Busy Beeway: A Game for Testing Human-Automation Collaboration for Navigation," In *Proceedings of the ACM SIGGRAPH Motion in Games (MIG)*, pp. 9:1–9:6, Barcelona, Spain, 2017.

[6] Hao-Tien (Lewis) Chiang, Baisravan HomChaudhri, Abraham P. Vinod, Meeko Oishi, Lydia Tapia, "Dynamic Risk Tolerance: Motion Planning by Balancing Short-Term and Long-Term Stochastic Dynamic Predictions," In *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, pp. 3762–3769, Singapore, May 2017.

[7] Hao-Tien (Lewis) Chiang, Nathanael Rackley, Lydia Tapia, "Runtime SES Planning: Online Motion Planning in Environments with Stochastic Dynamics and Uncertainty," In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, pp. 4802–4809, Daejeon, South Korea, October 2016.

[8] Aleksandra Faust, Hao-Tien (Lewis) Chiang, Nathanael Rackley, Lydia Tapia, "Avoiding Moving Obstacles with Stochastic Hybrid Dynamics using PEARL: PrEference Appraisal Reinforcement Learning," In *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, pp. 484–490, Stockholm, Sweeden, May 2016.

[9] Hao-Tien (Lewis) Chiang, Nathanael Rackley, Lydia Tapia, "Stochastic Ensemble Simulation Motion Planning in Stochastic Dynamic Environments," In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS)*, pp. 3836–3843, Hamburg, Germany, September 2015.

[10] Hao-Tien (Lewis) Chiang, Nicholas Malone, Kendra Lesser, Meeko Oishi, Lydia Tapia, "Path-Guided Artificial Potential Fields with Stochastic Reachable Sets for Motion Planning in Highly Dynamic Environments," In *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*, pp.2347–2354, Seattle, Washington, May 2015.

[11] Hao-Tien (Lewis) Chiang, Nicholas Malone, Kendra Lesser, Meeko Oishi, Lydia Tapia, "Aggressive Moving Obstacle Avoidance Using a Stochastic Reachable Set Based Potential Field," In *International Workshop on Algorithmic Foundations of Robotics (WAFR)*, Istanbul, Turkey, Aug 2014. Published in H. Akin et al., editors, Algorithmic Foundations of Robotics XI, pp. 73–90, Zeist, Springer, 2015.

Experience

University of New Mexico, Computer Science Department, Albuquerque, New Mexico
Research Assistant **May 2014 - present**
Research focuses on robot motion planning and reinforcement learning

New Mexico Consortium, Los Alamos, New Mexico
Student Researcher **May 2013 - May 2014**
Research focused on quantum algorithms. Supervised by Rolando Somma.

University of New Mexico, Physics Department, Albuquerque, New Mexico *Teaching Assisting* **May 2013 - May 2014**
Teaching assistant for Electromagnetism, graded homework.
Student Instructor for calculus-based General Physics II, given 3 hour/week lectures.
Teaching assistant for Numerical Methods in Physics, give 2 one-hour lectures and graded homework and design class projects.

National Taiwan University, Department of Mathematics, Taipei, Taiwan
Research Assistant **January 2011 - May 2011**
Research focuses on finite-volume numerical methods for hyperbolic partial differential equations.

Republic of China Air Force, Taipei, Taiwan
Air Traffic Control Corporal **September 2009 - August 2010**

International Academic Service and Activities

Third Machine Learning in Planning and Control of Robot Motion Workshop, Student Organizer, 2018.
Student organizer for a workshop that integrates researchers in machine learning, robot motion planning and control at the 2018 International Conference on Robotics and Automation (ICRA) in Brisbane, Australia, May 2016.

Becoming a Robot Guru 2: Integrating Science, Engineering and Creativity Workshop, Student Organizer, 2016.
Student organizer for a broadening participation in computing workshop at the 2016 Robotics: Science and Systems Conference (RSS) in Ann Arbor, MI, June 2016. Awarded budget of $20,000 from the Computing Research Association Committee on the Status of Women in Research and the Coalition to Diversify Computing to fund student travel awards to the workshop.

Mentoring

- Alumni:
  Undergraduate:
  - Fredrick Lee (Sophomore, 2016-2017),
  - Ting-Yun Chang (Senior, 2017-2017).

  High school:
  - Yu-Ming Cheng (Sophomore, 2007-2008),
  - Li-huang Li (Sophomore, 2007-2008).

- Current:
  Undergraduate:
  - Lee Smith (Senior, 2016-Present).

Outreach

Robotics and research demonstration
Our team demonstrated robot teams and video games developed in-house for crowd-sourcing solutions to challenging problems such as molecular docking or collaborative navigation. These demonstrations were at the following events: 1) Discover STEM Day (2018), 2) Escuela del Sol Montessori School (2017 and 2016), and 3) New Mexico CS4All, (2015)