Christopher W. Lum

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Current Positions

Research Scientist (2010-present), University of Washington
Lecturer (2013-present), University of Washington
Instructor (2007-2013), University of Washington

Education

University of Washington, Bachelor of Science, 2003
University of Washington, Master of Science in Aeronautics and Astronautics, 2005
University of Washington, Doctorate of Philosophy, 2009

Experience

2009-2011	Adjunct Professor of Mechanical Engineering, Seattle University
2009-2010	Post-Doctoral Research Associate, University of Washington
2004-2009	Research Assistant, University of Washington
2003-2004	Teaching Assistant, University of Washington
2004-2004	Engineering Intern, Insitu Inc.
2001-2003	Crew, Kirsten Wind Tunnel

Research Interests

Christopher Lum's research interests include unmanned systems, dynamics and control, and algorithm development. His PhD research at the University of Washington focused on the development of intelligent, autonomous algorithms for heterogeneous unmanned aerial systems (UAS) involved various missions such as search and rescue, path planning, and target identification. During his postdoctoral work, he extended much of this work to include integration onto Boeing flight test hardware and human-in-the-loop architectures. As a research scientist, he has focused on probabilistic models assessing the risk of UAS mission and operations within the national airspace. He has also investigated human/operator interactions of mixed component systems with a focus on systems such as the Insitu ScanEagle. He continues to work with industry groups such as Boeing developing autonomous algorithms for formation flight and swarm control. He is also greatly interested in the pedagogical and teaching aspects of academia. He has taught graduate and undergraduate classes at multiple institutions including courses on atmospheric flight mechanics, control systems sensors and actuators, dynamic systems, and stability and control of flight vehicles.

Selected Honors

UW Aeronautics and Astronautics Instructor of the Year (2013), UW Aeronautics and Astronautics Instructor of the Year (2012), University of Washington College of Engineering's List of Highly Rated Instructors (2011), Best Student Technical Paper at AIAA Infotech@Aerospace conference (2009), Outstanding Paper Award at AIAA Aerodynamic Measurement Technology and Ground Testing conference (2008), NASA Space Grant Consortium Graduate Fellowship (2007), Osberg Family Trust Fellowship (2005)

Selected Publications

1. C. W. Lum, J. Vagners, M. Vavrina, and J. Vian, "Formation Flight of Swarms of Autonomous Vehicles in Obstructed Environments Using Vector Field Navigation," *Submitted to the International Conference on Unmanned Aircraft Systems*, June 2012
2. C. W. Lum, K. Gauksheim, T. Kosel, and T. McGeer, "Assessing and Estimating Risk of Operating Unmanned Aerial Systems in Populated Areas," *Proceedings of the AIAA Aviation Technology, Integration, and Operations Conference*, September 2011
3. C. W. Lum, and B. Waggoner, "A Risk Based Paradigm and Model for Unmanned Aerial Systems in the National Airspace" *Proceedings of AIAA Infotech@Aerospace Conference*, March 2011.
4. C. W. Lum, J. Vagners, J. S. Jang, and J. Vian, "Partitioned Searching and Deconfliction: Analysis and Flight Tests" *Proceedings of the AACC American Control Conference*, June 2010.
5. C.W. Lum, R.T. Rysdyk, and J. Vagners, "A Search Algorithm for Teams of Heterogeneous Agents with Complete Coverage Guarantees" *AIAA Journal of Aerospace Computing, Information, and Communicatino, Volume 7, pg.1-31.*
6. C.W. Lum and J. Vagners, "A Modular Algorithm for Exhaustive Map Searching Using Occupancy Based Maps" *Proceedings of the AIAA Infotech@Aerospace Conference*, April 2009 (Best Student Technical Paper Award)
7. C.W. Lum and R.T. Rysdyk, "Feature Extraction of Low Dimensional Sensor Returns for Autonomous Target Identification" *Proceedings of the AIAA Guidance, Navigation, and Control Conference*, August 2008
8. C.W. Lum, M. L. Rowland, and R.T. Rysdyk, "Human-in-the-Loop Distributed Simulation and Validation of Strategic Autonomous Algorithms" *Proceedings of the AIAA Aerodynamic Measurement Technology and Ground Testing Conference*, June 2008 (Outstanding Paper Award)
9. C.W. Lum and R.T. Rysdyk, "Time Constrained Randomized Path Planning Using Spatial Networks" *Proceedings of the AACC American Control Conference,* June 2008
10. C.W. Lum, R.T. Rysdyk, and A. Pongpunwattana, "Occupancy Based Map Searching Using Heterogeneous Teams of Autonomous Vehicles" *Proceedings of the AIAA Guidance, Navigation, and Control Conference*, August 2006