

Dr. Luke A. Wendt

[Luke-A-Wendt.info](http://Luke-A-Wendt.info)

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Control Engineer



## Interests

**Control** Theory, **Robotics**, Computer Vision, **Optimization**, Machine **Learning**, Model Predictive Control, Generative Adversarial Networks, Dynamic Programming, Random Processes, Nonlinear Systems, Adaptive Control, Stochastic Control, Reinforcement Learning, System Identification, Compressed Sensing, Sparse Coding, Long Short-Term Memory, Recurrent Neural Networks, Embodied Cognition, Deep Neural Networks, Virtual Reality, Augmented Reality, Soft Robotics, Bionics, Mobile and Walking Robotics, Embedded Systems, Evolutionary Algorithms, Simultaneous Mapping and Localization, Sensor Fusion

## Education

|   |      |
|---|------|
| <b>Ph.D. in Electrical &amp; Computer Engineering; University of Illinois at Urbana-Champaign</b><br>Magna Cum Laude                        | 2017 |
| <b>Masters in Electrical &amp; Computer Engineering; University of Illinois at Urbana-Champaign</b><br>Magna Cum Laude                      | 2013 |
| <b>B.S. Physics &amp; Engineering; Hope College</b> , Holland, MI<br>Magna Cum Laude, Electrical Emphasis (ABET accredited) with Math Minor | 2007 |

## Research

|   |            |
|---|------------|
| <b>Petronics</b> , UIUC <b>Research Park</b> <ul style="list-style-type: none"><li>AR robot control interface with integrated sensor fusion and map building</li><li>multi-session SLAM with monocular camera and globally consistent occupancy</li><li>autonomous driving with surface-aware planning and dynamic obstacle avoidance</li><li>motion stabilized mobile 360 camera</li></ul> | 2017-2018  |
| <b>Language Acquisition and Robotics Lab</b> , UIUC <ul style="list-style-type: none"><li>fine motor control and motor sensory integration using reinforcement learning</li><li>iCub embodied cognition research - open source humanoid robotic</li></ul>   | 2009-2017  |
| <b>Promoting Undergraduate Research in Engineering</b> , UIUC   | 2014       |
| <b>Valve Software Corporation</b> , Bellevue, WA<br>adaptive dynamic tracking systems for virtual and augmented reality   | 2012       |
| <b>Lunar Planetary Science Academy</b> , NASA's Goddard Space Flight Center<br>team leadership position; design of a laser ranging and communication system   | 2009       |
| <b>Lakeshore Vision &amp; Robotics</b> ; Zeeland, MI<br>automated 3D inspection; quality control of automotive & medical parts  | 2005, 2007 |
| <b>Tetrahedral Robotics Research</b> , NASA's Goddard Space Flight Center<br>dynamic modeling, control, and construction of reconfigurable tetrahedral robot  | 2006-2007  |

## Awards

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|--|------------|
| <b>Beckman Institute</b> Cognitive Science / Artificial Intelligence Award | 2013, 2014 |
| Engineering Open House 1 <sup>st</sup> Place "Most Innovative"             | 2018       |
| <b>Small Business Innovation Research</b> , co-wrote and won over \$1mil   | 2018       |

## References

|  |                           |                            |
|--|---------------------------|----------------------------|
| <a href="mailto:dave@petronics.io">dave@petronics.io</a>         | Dave Cohen                | Petronics Founder          |
| <a href="mailto:davidjun@petronics.io">davidjun@petronics.io</a> | Dr. David Jun             | Petronics Founder          |
| <a href="mailto:abrahantes@hope.edu">abrahantes@hope.edu</a>     | Dr. Miguel Abrahantes     | Undergraduate Advisor      |
| <a href="mailto:selevins@illinois.edu">selevins@illinois.edu</a> | Dr. Stephen E. Levinson   | Graduate Advisor           |
| <a href="mailto:jhasegaw@illinois.edu">jhasegaw@illinois.edu</a> | Dr. Mark Hasegawa-Johnson | Doctoral Committee         |
| <a href="mailto:jmakela@illinois.edu">jmakela@illinois.edu</a>   | Dr. Jonathan J. Makela    | Doctoral Committee         |
| <a href="mailto:frothga@sandia.gov">frothga@sandia.gov</a>       | Dr. Fred H. Rothganger    | Doctoral Committee         |
| <a href="mailto:d-block@illinois.edu">d-block@illinois.edu</a>   | Daniel J. Block           | Control Systems Laboratory |
| <a href="mailto:oelze@illinois.edu">oelze@illinois.edu</a>       | Dr. Michael L. Oelze      | Senior Design Laboratory   |
| <a href="mailto:carney@illinois.edu">carney@illinois.edu</a>     | Dr. Paul S. Carney        | Senior Design Laboratory   |
| <a href="mailto:swenson1@illinois.edu">swenson1@illinois.edu</a> | Dr. Gary R. Swenson       | Senior Design Laboratory   |
| <a href="mailto:seth@illinois.edu">seth@illinois.edu</a>         | Dr. Seth A. Hutchinson    | Senior Design Laboratory   |

## Literacy



|                            |   |                |
|----------------------------|---|----------------|
| <b><u>Teaching</u></b>     | <b>ECE 517</b> : Nonlinear and Adaptive Control, Lecture TA                                       | 2012, 2013     |
|                            | <b>ECE 515</b> : Control System Theory, Lecture TA  | 2010           |
|                            | <b>ECE 490</b> : Introduction to Optimization, Lecture TA   | 2012           |
|                            | <b>ECE 470</b> : Introduction to Robotics, Lab and Lecture TA                                     | 2011-2015      |
|                            | <b>ECE 486</b> : Control Theory, Lab and Lecture TA   | 2009-2014      |
|                            | <b>ECE 445</b> : <a href="#">Senior Design Laboratory</a> , Lab TA                                | 2016-2017      |
|                            | <a href="#">Self-Stabilizing Spherical Robot</a>  | Control Award  |
|                            | <a href="#">Virtual Reality Bicycle</a>   | VR Award       |
|                            | <a href="#">Earthworm Robot</a>   | Research Award |
|                            | <a href="#">Coil Gun Control System</a>   |                |
|                            | <a href="#">Impeller Quadcopter Design</a>  |                |
|                            | <a href="#">Secure Drone Delivery</a>   |                |
|                            | <a href="#">Smart Automated Closet</a>  |                |
|                            | <a href="#">Programmable Ferrofluid Display</a>   |                |
|                            | <a href="#">Ferrofluid Clock</a>  |                |
|                            | <a href="#">Grain Quality Test Kit</a>  |                |
|                            | <a href="#">Dynamic Ferrofluid Lamp</a>   |                |
|                            | <a href="#">Programmable Whiteboard</a>   |                |
|                            | <a href="#">VR Haptic Feedback Glove</a>  |                |
|                            | <a href="#">"I'm Cooking" Smoke Detector</a>  |                |
|                            | <a href="#">Water Aliasing</a>  |                |
|                            | <a href="#">Autonomous Dog Entertainment</a>  |                |
|                            | <a href="#">Crowd Monitoring Device</a>   |                |
|                            | <a href="#">Carney Confocal Microscopy</a>  |                |
|                            | <b>ECE 313</b> : Probability with Engineering Application, Lecture TA                             | 2013           |
|                            | <b>ECE 310</b> : Digital Signal Processing, Lecture TA  | 2014           |
|                            | <b>ECE 210</b> : Analog Systems, Lab and Lecture TA   | 2010, 2014     |
|                            | <b>ENG 199</b> : Robotics with Lego Mindstorms, FIRST Robotics Tournament                         | 2008           |
|                            | <b>ECE 110</b> : Introduction to Electrical and Computing Engineering                             | 2013           |
| <b><u>Coursework</u></b>   | <b>ECE 448</b> : Artificial Intelligence  | S. Levinson    |
|                            | <b>ECE 470</b> : Introduction to Robotics   | S. Hutchinson  |
|                            | <b>ECE 490</b> : Introduction to Optimization   | P. Kumar       |
|                            | <b>ECE 515</b> : Control System Theory  | D. Liberzon    |
|                            | <b>ECE 517</b> : Nonlinear and Adaptive Control   | D. Liberzon    |
|                            | <b>ECE 528</b> : Analysis of Nonlinear Systems  | G. Dullerud    |
|                            | <b>ECE 534</b> : Random Processes   | P. Moulin      |
|                            | <b>ECE 549</b> : Computer Vision  | S. Lazebnik    |
|                            | <b>ECE 553</b> : Optimum Control Systems  | T. Basar       |
|                            | <b>ECE 555</b> : Control of Stochastic Systems  | M. Belabbas    |
|                            | <b>ECE 580</b> : Optimization by Vector Space Methods   | T. Basar       |
|                            | <b>ECE 594</b> : Math Models of Language  | S. Levinson    |
|                            | <b>ECE PhD Thesis</b> : L. Wendt  | 2017           |
| <b><u>Publications</u></b> | <b><a href="#">Optimal Nonlinear Control and Estimation Using Global Domain Linearization</a></b> |                |
|                            | <b>ECE MS Thesis</b> : L. Wendt   | 2013           |
|                            | <b><a href="#">Optimal Adaptive Control with <math>\Theta</math>LQG</a></b>                       |                |
|                            | <b>Conference</b> : S. Levinson, A. Silver, L. Wendt  | 2010           |
|                            | <b><a href="#">Vision Based Balancing Tasks for the iCub Platform</a></b>                         |                |
|                            | <b>Conference</b> : L. Majure, L. Niehaus, A. Duda, A. Silver, L. Wendt, S. Levinson              | 2010           |
|                            | <b><a href="#">Integrating Language and Motor Function on a Humanoid Robot</a></b>                |                |
|                            | <b>IEEE Symposium</b> : M. Abrahantes, A. Silver, L. Wendt, D. Lithio                             | 2008           |
|                            | <b><a href="#">Construction and Control of a 4-Tetrahedron Walker Robot</a></b>                   |                |
|                            | <b>IEEE Symposium</b> : M. Abrahantes, A. Silver, L. Wendt  | 2007           |
|                            | <b><a href="#">Gait Design and Modeling of a 12-Tetrahedron Walker Robot</a></b>                  |                |