Eric Cousineau

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Interests

Robotics, control theory and implementation, dynamical systems, cyber-physical systems, software development, version control, test-driven development, computer vision, and machine learning.

Education

M.S. Mechanical Engineering, Texas A & M University (Dec. 2014)

GPA of 3.8

Coursework – Linear Control System Design, Nonlinear Control System Design, Partial Differential Equations, Dynamical Systems, Mechanical Vibrations, Numerical Analysis, Survey of Optimization Methods

B.S. Mechanical Engineering, Texas A & M University (Dec. 2011)

Magna Cum Laude with GPA of 3.8

Coursework – Introduction to Robotics, Advanced Systems and Controls, Senior Design Project with NASA, Experimentation and Design, Finite Element Analysis, Thermofluid Analysis and Design, Solid Mechanics in Design, Materials and Manufacturing

Experience

Employment

Software Engineer at Toyota Research Institute, Cambridge, MA (Mar. 2017 – Present)

Focused on robotics, control, and perception.

Contributor to Drake [Website].

Robotics Developer at MathWorks, Natick, MA (Sep. 2015 – Mar. 2017)

Part of Robotics System Toolbox (Nov. 2016 – Mar. 2017).

Application Support Engineer in the Engineering Development Group, specializing in Control, Design, and Automation. Focused on Simulink and Code Generation. (Sep. 2015 – Nov. 2016)

Research Engineer under Dr. Aaron Ames, Texas A & M University (Jan. 2015 – Jun. 2015)

Real-time control for hybrid zero dynamics walking on SRI's 3D humanoid platform, PROXI [Video].

Graduate Research Assistant under Dr. Aaron Ames, Texas A & M University (Aug. 2012 – Dec. 2014)

Experimentally realized bipedal walking on SRI's DURUS prototype bipedal robot [Video].

Worked towards human-inspired control for Valkyrie, as part of NASA JSC'S team for DARPA Robotics Challenge [Video], with simulation framework and soft real-time framework.

BMW Future Assessment Monitor under Dr. Carlos Acosta, Universidad de Las Américas, Puebla (Feb. 2012 – May 2012)

Conducted survey of novel automotive technologies.

Undergraduate Research Assistant under Dr. Aaron Ames, Texas A & M University (May 2011 – Feb. 2012in)

Part of AMBER Lab, worked towards experimentally validating human-inspired walking using Aldebaran's NAO robot.

Funded by Undergraduate Research Grant (May 2011 – Aug. 2011) and Dr. Aaron Ames (Aug. 2011 – Dec. 2011).

Intern at L-3 Communications, Johnson Space Center, Clear Lake, TX (May 2009 – Aug. 2009)

Developed a new client library in C# for the Information Sharing Protocol developed by NASA.

Intern at Telligent, Dallas, TX (Jun. 2008 – Aug. 2008)

Developed automation tools to create demonstration website for Telligent Community.

Publications

A. Hereid, C. Hubicki, E. Cousineau, and A. Ames. **Dynamic Humanoid Locomotion: A Scalable Formulation for HZD Gait Optimization**. *IEEE Transactions on Robotics, 2018*.

A. Hereid, E. Cousineau, C. Hubicki, and A. Ames. **3D Dynamic Walking with Underactuated Humanoid Robots: A Direct Collocation Framework for Optimizing Hybrid Zero Dynamics**. *International Conference on Robotics and Automation, 2016*.

J. Reher, E. Cousineau, A. Hereid, C. Hubicki, and A. Ames. **Realizing Dynamic and Efficient Bipedal Locomotion on the Humanoid Robot DURUS**. *International Conference on Robotics and Automation, 2016*.

E. Cousineau and A. Ames. **Realizing Underactuated Bipedal Walking with Torque Controllers via the Ideal Model Resolved Motion Method**. *International Conference on Robotics and Automation, 2015*.

A. Hereid, C. Hubicki, E. Cousineau, J. Hurst, and A. Ames. **Hybrid Zero Dynamics Based Multiple Shooting Optimization with Applications to Robotic Walking**. *International Conference on Robotics and Automation, 2015*.

M. Powell, E. Cousineau, and A. Ames. **Model Predictive Control of Underactuated Bipedal Robotic Walking**. *International Conference on Robotics and Automation, 2015*.

N. Radford et al. **Valkyrie: NASA's First Bipedal Humanoid Robot**. *Journal of Field Robotics, 2015*.

A. D. Ames, E. A. Cousineau, M. J. Powell. **Dynamically Stable Bipedal Robotic Walking with NAO via Human-Inspired Hybrid Zero Dynamics**. *Hybrid Systems: Computation and Control, 2012*.

Skills

Programming: C++, Python, bash, MATLAB, Simulink, LaTeX, Mathematica, C#, Java, Javascript

Tools: Git, Bazel, CMake, Sublime, Jupyter / IPython, CLion, GNU Make, QtCreator, Eclipse

Libraries / Frameworks: ROS1, Eigen, NumPy, PyTorch, pybind11, OpenCV

Markup: YAML, JSON, XML, HTML, CSS

Platforms: Ubuntu Linux, Windows

Languages: English, Spanish