

## Adam Eric Leeper

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### EXPERIENCE

- Google, Mountain View, CA - Engineering Manager** 2018 - 2020  
**Google, Mountain View, CA - Senior Software Engineer / Technical Lead Manager** 2016 - 2018  
**Google, Mountain View, CA - Software Engineer** 2014 - 2016
- Led team designing ARCore public API, system architecture, and sensor management (C++, Java).
  - Managed 12 engineers; recruited and hired 10+ software engineers.
  - Developed algorithms and applications for visual-inertial SLAM and sparse mapping in Project Tango.
- hiDOF, South San Francisco, CA - Senior Systems Engineer** 2013 - 2014
- Developed algorithms in C++ for visual monocular SLAM and wheeled vehicle motion planning.
- Willow Garage, Menlo Park, CA - Research Intern** 2010 - 2013
- Developed robotic systems, conducted user experiments, and published papers in major robotics conferences.
- Salisbury Robotics Lab, Stanford, CA - Graduate Researcher** 2008 - 2013
- Developed new algorithms and sensors for haptic rendering and robot control.
  - Developed web-based visualization software for multi-body systems.
- Electrical Engineering Intern - Qual-Tron, Inc., Tulsa, OK** 2006 - 2007
- Led redesign of a magnetic sensor product to reduce cost and simplify assembly.

### SKILLS

**Applied Math** - Expert in dynamics, kinematics, and 3D geometry as applied to robotics, simulation, and graphics.  
**Software Languages** - C++ (12 years) and Android Java (6 years) in large codebases (100+ engineers) featuring multi-threaded, event-driven, and multi-process designs. Also proficient in Python, Javascript, MATLAB, SQL.  
**Software Libraries** - Expert knowledge of ROS. Experience with three.js, OpenGL, OpenCV, Eigen, Qt, PCL.  
**Development Environments** - Linux (expert), Mac, Windows, using version control (e.g. git) and issue tracking.  
**Electronics** - Circuit design/debugging; some experience with PCB layout/fabrication and embedded systems.  
**Hardware** - General machine shop rapid-prototyping skills, and proficient in CAD tools (Solidworks).  
**Languages** - English (native), Spanish (fluent), French (proficient).  
**Other** - Private pilot, recording engineer, bassist, drummer.

### EDUCATION

- Ph.D.** Mechanical Engineering, Stanford University, 3.94 GPA 2013  
**M.S.** Mechanical Engineering, Stanford University, 3.97 GPA 2009  
**B.S.** Engineering Physics, The University of Tulsa, 3.99 GPA 2007

### TEACHING

*Teaching evaluations available on request.*

- Instructor:** COMP 2140, Programming I, Tennessee State University, 50 students. Fall 2020  
**Instructor:** ENGR 105, Controls, Stanford University, 72 students. Winter 2016  
**Instructor:** ENGR 105, Controls, Stanford University, 70 students. Winter 2015  
**Instructor:** ENGR 14, Statics, Stanford University, 77 students. Spring 2014  
**Instructor:** ME 101, Dynamics, San Jose State University, 35 students. Fall 2013  
**Instructor:** ME 101, Dynamics, San Jose State University, 49 students. Fall 2012  
**Instructor:** ME 101, Dynamics, San Jose State University, 56 students. Fall 2011  
**Instructor:** Programming and Robotics, Stanford EPGY Summer Institutes, 50 students. Summer 2010
- Course Assistant: ME 331b - Dynamics and Control with Paul Mitiguy. Spring 2012  
Course Assistant: CS 277 - Experimental Haptics with Ken Salisbury. Winter 2011  
Course Assistant: CS 223a - Robotics with Oussama Khatib. Winter 2010  
Course Assistant: ENGR 15 - Dynamics with Paul Mitiguy. Fall 2009

## **PUBLICATIONS**

**A. Leeper**, K. Hsiao, M. Ciocarlie, I. Sucan, and K. Salisbury. Methods for Collision-Free Arm Teleoperation in Clutter Using Constraints from 3D Sensor Data. 2013 International Conference on Humanoid Robots. October, 2013. Atlanta, Georgia.

**A. Leeper**, K. Hsiao, M. Ciocarlie, I. Sucan, K. Salisbury. Assisted Arm Teleoperation in Clutter Using Constraints from 3D Sensor Data. In 2nd Workshop on Robots in Clutter: Preparing robots for the real world (in conjunction with RSS). June 2013, Berlin, Germany.

Chen, Tiffany., Ciocarlie, Matei., Cousins, Steve., Grice, Phillip M., Hawkins, Kelsey., Hsiao, Kaijen., Kemp, Charlie., King, ChihHung., Lazewatsky, Daniel., **Leeper, Adam Eric.**, Nguyen, Hai., Paepcke, Andreas., Pantofaru, Caroline., Smart, William., and Takayama, Leila. Robots for humanity: using assistive robotics to empower people with disabilities. IEEE Robotics and Automation Magazine special issue on Assistive Robotics. Volume 20, Issue 1, 2013.

A. Pratkanis, **A. Leeper**, K. Salisbury. Replacing the Office Intern: An Autonomous Coffee Run with a Mobile Manipulator. ICRA, May 2013, Karlsruhe, Germany.

M. Ciocarlie, K. Hsiao, **A. Leeper**, D. Gossow. Mobile Manipulation Through an Assistive Home Robot. IROS, October 2012, Algarve, Portugal.

**A. Leeper**, S. Chan, and K. Salisbury. Point Clouds Can Be Represented as Implicit Surfaces for Constraint-Based Haptic Rendering. ICRA, May 2012, St. Paul, MN.

**A. Leeper**, S. Chan, K. Hsiao, M. Ciocarlie, K. Salisbury. Constraint-based Haptic Rendering for Teleoperated Robot Grasping. IEEE Haptics Symposium, March 2012, Vancouver, Canada.

**A. Leeper**, K. Hsiao, M. Ciocarlie, L. Takayama, D. Gossow. Strategies for Human-in-the-Loop Robotic Grasping. HRI, March 2012, Boston, MA.

R. Brewer, **A. Leeper**, K. Salisbury. A Friction Differential and Cable Transmission Design for a 3-DOF Haptic Device with Spherical Kinematics. IROS, Sept. 2011, San Francisco, CA.

D. Gossow, **A. Leeper**, D. Hershberger, M. Ciocarlie. Interactive Markers: 3-D User Interfaces for ROS Applications [ROS Topics]. IEEE Robotics and Automation Magazine, December 2011.

**A. Leeper**, S. Chan, and K. Salisbury. Constraint-based 3-DOF Haptic Rendering of Arbitrary Point Cloud Data. RSS Workshop on RGB-D Cameras, June 2011, Los Angeles, CA.

**A. Leeper**, K. Hsiao, E. Chu, and K. Salisbury. Using Near-Field Stereo Vision for Robotic Grasping in Cluttered Environments. ISER, Dec. 2010, Delhi, India.

Caruso, John F; Hari, P; **Leeper, Adam E**; Coday, Michael A; Monda, Julie K; Ramey, Elizabeth S; Hastings, Lori P; Golden, Mallory R; Davison, Steve W. Impact of Acceleration on Blood Lactate Values Derived From High-Speed Resistance Exercise. Journal of Strength & Conditioning Research. 23(7):2009-2014, October 2009.

Caruso J.F., Hari P., Coday M.A., **Leeper A.**, Ramey E.S., Monda J.K., Hastings L.P., and Davison S. (2008). Performance evaluation of a high-speed inertial exercise trainer. The Journal of Strength & Conditioning Research. 22(6): 1760-1768.

**A. Leeper**, M. Coday, P. Hari, J. Caruso. Instrumentation of a High-Speed Inertial Exercise Device Using Load Cell Transducers. Proceedings of 53rd International Instrumentation Symposium, April 2007, Tulsa, OK.

## **PRESENTATIONS**

### **Invited Talks:**

“Telemanipulation using PCL.” PCL Tutorial at Robotics: Science and Systems 2011. Los Angeles, CA. July 2011.

“Instrumentation of a High-Speed Inertial Exercise Device Using Load Cell Transducers.” ISA EXPO 2007. Houston, TX. October 2007.

### **Conference Presentations:**

“Assisted Arm Teleoperation in Clutter Using Constraints from 3D Sensor Data.” 2nd Workshop on Robots in Clutter: Preparing Robots for the Real World (in conjunction with RSS). Berlin, Germany. June 2013.

“Point Clouds Can Be Represented as Implicit Surfaces for Constraint-Based Haptic Rendering.” International Conference on Robotics and Automation. St. Paul, MN. May 2012.

“Constraint-based Haptic Rendering for Teleoperated Robot Grasping.” IEEE Haptics Symposium. Vancouver, Canada. March 2012.

“Constraint-based 3-DOF Haptic Rendering of Arbitrary Point Cloud Data.” RGB-D: Advanced Reasoning with Depth Cameras (workshop in conjunction with RSS). Los Angeles, CA. June 2011.

“Using Near-Field Stereo Vision for Robotic Grasping in Cluttered Environments.” International Symposium on Experimental Robotics. New Delhi, India. December 2010.

“Instrumentation of a High-Speed Inertial Exercise Device Using Load Cell Transducers.” 53rd International Instrumentation Symposium. Tulsa, OK. April 2007.

#### **OPEN SOURCE SOFTWARE** ([github.com/aleeper](https://github.com/aleeper))

MGView - Javascript web app for visualizing rigid body simulations. Author and maintainer.

ROS - Contributor and maintainer of packages in the visualization and device driver stacks.

MoveIt! - Contributor to the user interaction and visualization tools within MoveIt!

three.js - Contributed STL parser module to enable importing of CAD parts (e.g. from SolidWorks).

#### **AWARDS**

2007-2012 National Science Foundation Graduate Research Fellowship

2007 Stanford Graduate Fellowship

2007 John McCamey Award presented by ISA

Member, Tau Beta Pi Engineering Honor Society

Member, Sigma Pi Sigma Physics Honor Society

Member, Phi Kappa Phi Honor Society

Member, Mortar Board National College Senior Honor Society

#### **REFERENCES**

Available on request.