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Qualifications

- Successfully designed, built, and deployed a subsea datacenter in about a year
- Rebuilt Holoportation to fit into a moving vehicle
- Designed and built several robotic and autonomous systems, for both commercial and government clients
- Management experience in military, medical, and private industry research, as well project design and development
- Lead author of *Hacking the Kinect*, as well as a published author in multiple academic and industry publications
- Master of Science in Computer Science and Bachelor of Science in Electrical Engineering

Specialized Qualifications

- Academic: Mobile Robotics, Computer Vision (3D and 2D), Artificial Intelligence, Machine Learning, Control Systems, Neural Networks, Distributed Systems, Mathematical Filters, Sensor Fusion, Autonomous Vehicles
- Technical: Go, Python, TSDB, SQL, C/C++, Java, Assembler, Ladder, Embedded Systems

Experience

Senior Member of Technical Staff — Redmond, WA
Microsoft Research — Aug. 2014 - Present

- Engineering and Program Management for Project Natick (http://projectnatick.com/)
  - Designed and built a subsea datacenter
  - Solved problems at every level of the stack - from hardware and software to thermal physics models to marketing and promotion
  - Worked with and helped manage a large number of contractors to deliver the project on time
  - Developed and executed rapid experiments to test solutions to difficult problems
  - Proved a variety of alternative cooling schemes for a subsea datacenter
  - Architected and implemented a cloud connected, high speed sensor network for system health and control
  - Successfully troubleshot difficult problems with the implementation of the vessel in the process of building the system
  - Designed and built the Project Natick website, as well as participated in all aspects of marketing and launch
- Engineering for Holoportation
  - Rebuilt Holoportation to fit into a vehicle
  - Reduced bandwidth requirements by 97%
  - Reduced required onboard computation from seven machines to one
  - Built custom hardware and systems to support in-vehicle Holoportation

Consultant Redmond, WA
Lightning Dynamics September 2011 - Present

- Developer of Computer Vision Systems and Algorithms
  - Built multiple systems for independent commercial projects
  - New product development for multiple Fortune 500 companies
  - Developed demo applications and proof of concept works
- Project Manager and Developer for Pipe Rupture and Gas Flow Simulations
  - Managed small team to develop project to specification
  - Developed software for a numerical method of simulation
  - Handled budgeting and financial accountability of the project

Lead Robotics Engineer Valley City, OH
MTD Products Apr. 2013 - Jul. 2014

- Software and Electrical Team Lead on autonomous lawnmower project
  - Led software and electrical product design for autonomous robot system, with five direct reports
  - Worked in a crossfunctional group to design a product using privileged consumer insights
  - Interfaced with stakeholders and suppliers to drive requirements and system choices
  - Built system requirements from focus group and consumer event interactions
  - Designed the software and hardware architecture from the ground up, from embedded systems to the cloud
  - Wrote advanced robot simulation software for test, validation, and analysis
  - Performed sensor system design and analysis

Senior Roboticist Pittsburgh, PA
Deeplocal Dec. 2012 - Mar. 2013

- Creative coding and design for multiple clients
  - Designed innovative experiences for major brands
  - Implemented prototypes of experiences
  - Addressed proposals and technology feasibility requests with both advertising agencies and brands
  - Made successful pitches to brands and agencies, including Google

Cofounder Pittsburgh, PA
Spark Inc. Feb. 2012 - Nov. 2012

- Cofounder and Technology Lead
  - Led development of cross-platform interactive motion API
  - Designed and implemented gesture recognition systems
  - Created technology demonstrations utilizing the Microsoft Kinect SDK
  - Wrote business plans and models for art and education markets
  - Interviewed customers to better make product choices

Research Programmer Pittsburgh, PA
NREC - National Robotics Engineering Center Oct. 2010 - Dec. 2012

- Research Programmer for multiple robotics projects
  - Hybrid Safety System (HSS) - industrial robot safety system to allow humans and robots to work in close proximity
  - Automated Hauling System (AHS) - autonomous driving for 38 ton mining trucks
  - ACRS - stripping paint from military planes with high powered lasers mounted to giant, mobile robot arms
  - Perception, sensor fusion, and occupancy probability
  - Self-driving vehicles and obstacle detection
  - Testing and verification for sensors and systems

Engineering Research Assistant Tampa, FL
iSSRT - Institute for Safety, Security, and Rescue Technologies Aug. 2005 - Aug. 2008

- Research assistant on engineering projects while continuing my graduate education in Computer Science, including:
  - Robot testing and verification
  - Design and development of a 3D laser range finder
  - Optic flow for obstacle avoidance
  - Fuzzy sensor fusion for navigation and control
  - Design and development of an unmanned surface vehicle (SeaRAI)
  - Adaptive sensor fusion for robot localization

Consultant Lake Forest, IL
Yaskawa Electric America Aug. 2004 - Dec. 2004

- Developed patented method for industrial machines
  - Responsible for all aspects of design and development
  - Task was thought to be impossible by industrial partners and internal to Yaskawa
  - Resulted in patent US20080082206 and a successful motion control product - Synchbelt

Education

University of South Florida — Tampa, FL
Master of Science in Computer Science — Aug. 2005 - May 2010

- Thesis: Accurate Localization Given Uncertain Sensors

University of Illinois at Urbana-Champaign — Urbana, IL
Bachelor of Science in Electrical Engineering — Aug. 2000 - May 2004

- Senior Project: Quantum Cryptography Randomization Engine

Publications

2017
- B. Cutler, S. Fowers, J. Kramer, E. Peterson. "Dunking the Datacenter". In *IEEE Spectrum*, March 2017

2016
- B. Cutler, N. Whitaker, S. Fowers, J. Kramer. "Artificial reef datacenter". *Patent US20160381835A1*, filed May 2016

2012
- J. Kramer and A. Kandel. "On Accurate Localization and Uncertain Sensors". In *International Journal of Intelligent Systems*, May 2012
- J. Kramer, M. Parker, D.C. Herrera, F. Echter, N. Burress. *Hacking the Kinect*. Published by APress in March 2012

2011
- J. Kramer and A. Kandel. "Robust Small Robot Localization From Highly Uncertain Sensors". In *IEEE SMC C*, Vol. 41, Issue 4, July 2011
- M. Lindemuth, R. Murphy, E. Steimle, W. Armitage, K. Dreger, T. Elliot, M. Hall, D. Kalyadin, J. Kramer, M. Palankar, C. Griffin, K. Pratt. "Sea Robot Assisted Inspection". In *IEEE Robotics and Automation Magazine*, June 2011

2009
- J. Kramer and A. Kandel. "Fuzzy Approaches to Driven Kalman Filtering for Small Robot Localization". In *International Conference for Advanced Robotics 2009 (ICAR 2009)*

2007
- K. Pratt and J. Kramer. "Sensor Fusion for Robot Navigation using a Fuzzy-EKF with Weighted Covariance". In *International Conference for Advanced Robotics 2007 (ICAR 2007)*, 2007

2006
- J.A. Kramer and R.R. Murphy. "UGV Acceptance Testing". In *Proceedings of SPIE – Volume 6230 (SPIE 2006)*, 2006
- J.A. Kramer and R.R. Murphy. "Endurance Testing for Safety, Security, and Rescue Robots". In *Performance Metrics for Intelligent Systems 2006 (PERMIS 2006)*, 2006