PETER K. ALLEN

as of April 1, 2020

EDUCATION

Ph.D.(honors), University of Pennsylvania, 1985, Computer Science.
M.S., University of Oregon, 1976, Computer Science.
A.B., Brown University, 1971, Mathematics-Economics.

APPOINTMENTS

2000-	Professor, Dept. of Computer Science, Columbia University.
1994-99	Associate Professor (w/tenure), Dept. of Computer Science, Columbia University.
1990-93	Associate Professor, Dept. of Computer Science, Columbia University.
1985-90	Assistant Professor, Dept. of Computer Science, Columbia University.

AWARDS

Computing Research Association Undergraduate Research Award, 2014. Awardee: Danfei Xu. Faculty Advisor: Peter K. Allen

Best Student Paper Award, World Haptics Conference 2007 (awarded to M. Ciocarlie, C. Lackner and P. Allen co-authors)

Wegbreit Prize for best manipulation paper: *Automatic Grasp Planning using Shape Primitives*, authors A. Miller, S. Knoop, H. Christensen and P. Allen, *IEEE Int. Conf. on Robotics and Automation*, Sep. 14-19, 2003.

Anton Philips Award for best paper, 1991 IEEE Robotics and Automation Conference (awarded to K. Tarabanis, co-authors P.K. Allen and R. Tsai).

Rockwell Trust Presidential Investigator Award, 1989-1994.

NSF Presidential Young Investigator Award, 1987.

Rubinoff Prize for innovative uses of computer technology, Univ. of Pennsylvania, 1986.

Army Research Office Fellowship 1984-1985.

CBS Foundation Fellowship, 1982-1983.

PROFESSIONAL ACTIVITIES

Chair, New England Manipulation Symposium, May 17, 2014; Editorial Board, Autonomous Robots Journal, 1995-2004; Organizer and Co-Chair, Engineering the Future of Surgery Symposium, Columbia University, April 8, 2002; Associate Editor, IEEE Transactions on Robotics and Automation, 1998-2002; Program Committees: ICRA 2014-2015; RSS 2011-2015; IROS 2007-2016; 3DIMPV 2011, 3DIM 2010, 2009;; 3DPVT 2008; ICRA 2007; 3DIM 2007; International Symposium on 3D Data Processing, Visualization and Transmission (3DPVT) 2006; International Workshop on 3D Virtual Reconstruction and Visualization of Complex Architectures (3D-Arch 2005); Intelligent Robots and Systems (IROS 2005); 3D Digital Imaging and Modeling (3DIM 2005); International Workshop on 3D Virtual Intelligent Robots and Systems (IROS 2005); 3D Digital Imaging and Modeling (3DIM 2005); Virtual Systems and Multimedia (VSMM 2005). IAS 2004, CIRA 2003, ACVA 2003, 3D Imaging 2003, Virtual and Augmented Architecture 2001, CIRA 2001, IROS O1, IAS; 01, CVPR 2001, 3D Imaging 2001; WACV 2000; IROS 20O0; Multi-Sensor Fusion 1999; Computer Vision and Pattern Recognition 1999; IEEE/RSJ Conference on Intelligent Robots and Systems 1999; IEEE International Conference on Robotics and Automation 1998; IEEE/RSJ Conference on Intelligent Robots and Systems 1998; IEEE International Conference on Robotics and Automation, 1997; IEEE/RSJ Conference on Intelligent Robots and Systems 1997; Multi-Sensor Fusion 1996; Workshop on Computer Vision, IROS 1995; NSF review panelist. Whitaker foundation review panelist.

DEPARTMENT SERVICE

Faculty Recruiting Chair, 2015-2017 Student Nominations, 2014-2017. MS Admission, 2013-2017. Faculty Recruiting 2013-2014. MS Track advisor, 2009-2014. Faculty Recruiting Chair, 2006-2013. Strategic Planning Committee,

2007-2011, chair, 2004-2005. Faculty Recruiting Chair, 2000-2005. SEAS Advisor; Strategic Planning Committee, 2000-2003. Facilities Chair, 1992-1999; Chairman, Planning Committee, new Student Research Lab, 1998; Vice Provost's Steering Committee on Biomedical Engineering, 1995-1997; Organizer and Editor, CISE Infrastructure Proposal, 1995; Academic Committee; TA Czar; Advisor, SEAS and General Studies.

RECENT INVITED TALKS

Teaching Robots to Grasp via Multi-Modal Geometric Learning, Keynote, IEEE UEMCON conference, Oct. 11, 2019.

Learning to Grasp, AI for Engineering Summer School, Toronto, August 22, 2019.

Multi-Modal Geometric Learning for Grasping and Manipulation, ICRA 2019 Vi-Tac workshop, May 23, 2019.

Multimodal Geometric Learning for Grasping, Carnegie Mellon Robotics Institute Seminar Series, Nov. 30, 2019

Human-Robot Interactive Control using Brain and Muscle Interfaces, Rutgers Center for Cognitive Science, Nov. 27 2019

Robots in the hospital, the home, and the cloud, IBM workshop, On the Cusp of Industrial and Healthcare IoT, Sep. 7,, 2017.

Shape Completion Grasping, Google Brain, NYC, Aug. 2, 2017.

Robots in the hospital, the home, and the cloud, New Frontiers in Robotics: Bringing Imagination to Market, Columbia University CTV, Oct. 19, 2017.

Deformable Object Manipulation Using Thin-Shell Predictive Modeling, NYC Soft Robotics Technology Group, Dec. 14, 2015.

Next generation Robotic Surgery, Distinguished Lecturer series, Computer Science Department, University of Delaware, Nov. 13, 2015.

Assistive Robotic Grasping, Rehabilitation Engineering Research Retreat, Columbia Medical center, Nov. 11, 2015.

Deformable Object Manipulation Using Thin-Shell Predictive Modeling, iRobot Corporation, August 19, 2015.

2D and 3D In-Vivo Imaging for Robotic Surgery, Technology & Medicine Fall 2014 Seminar Series, Columbia Medical Center, Oct. 21, 2014.

The Robots are Coming, The Robots are Coming, Columbia Alumni Association, Oct. 7, 2013.

Robotics in Medicine and Surgery, NYC BioTech, Feb. 12, 2014.

Real-Time Simulation for in-the-loop Grasping, IEEE Robotics and Systems Conference, Workshop on Beyond Robot Grasping: Modern Approaches for Dynamic Manipulation, Oct. 12, 2012, Villamoura Portugal

Robotics and the Cloud: Cloudlet Examples and Hints at the Future, NSF workshop on Cloud Robotics, Feb. 27, 2012

Next-Generation Robotic Surgery, Robotics Center, Georgia Tech, Nov. 16, 2011.

An In-Vivo Stereoscopic Imaging Device with Pan/Tilt and Integrated Lighting, Dept.of Mechanical Engineering, Vanderbilt University, March 21, 2011.

Data-Driven Grasping. Workshop on Grasping, IEEE Robotics and Automation conference, May 3, 2010.

Data-Driven Robotic Grasping Using Low-Dimensional Subspaces. NIH PI meeting, Sep. 1, 2010, Univ. Pittsburgh.

Data-Driven Grasping. IRobot Corporation, Aug. 17, 2010.

Robotic Grasping, DARPA ISAT workshop on Humanoids, July 21-22, 2009

Data-Driven Grasping. Understanding the Human Hand for Advancing Robotic Manipulation Workshop, Robotics Systems and Science, June 28, 2009.

Data Driven Grasping Using the Bajcsy Principles: Human Modeling, Active Sensing, and Lots of Results. University of Pennsylvania RobotFest, April 22, 2009.

In-Vivo Imaging and Effector Platforms for Single Port and NOTES Surgery. Johns Hoplins University, Dec. 3, 2009.

Graspit!: A Visualization and Simulation Engine for Grasping Research. University of Pennsylvania, Oct. 31, 2009

Case Studies in Cyber-Physical Systems: Smart Prosthetic Hands and In-Vivo Platforms for NOTES Surgery. NSF Cyber Physical Systems Workshop, Nice, France, Sep. 22, 2008.

Robotics Research at Columbia. Willow Garage, Menlo Park, CA, August 17, 2008.

Low-Dimensional Dexterous Grasping for Robotic and Prosthetic Hands. Workshop on "Is human-like dexterous manipulation within our robotic grasp?", ICRA 2008, May 20, 2008.

Dexterous Grasping via Eigengrasps: A Low-Dimensional Approach to a High-Complexity Problem. New England Manipulation Symposium, June 1, 2007, RPI.

Modeling and Visualizing Large Scale Outdoor Scenes, Rennselaer Polytechnic Institute, March 19, 2007

From Robotic Hands to Human Hands: A Visualization and Simulation Engine for Grasping Research, Dept. of Kinesiology, Arizona State University, Jan. 17, 2007.

Robotics at Columbia (outreach), Dobbs Ferry High School, Dec. 19, 2006.

Modeling and Visualizing Large Scale Outdoor Scenes, United States Park Service, Governors Island, NY, Dec. 13, 2006.

From Robotic Hands to Human Hands: A Visualization and SimulationEngine for Grasping Research, New England Manipulation Symposium, June 9, 2006.

Modeling and Visualizing Large Scale Outdoor Scenes, Cooper Union, December 5, 2006.

Seeing into the Past: New Digital Techniques for Archaeology, New York Conservation Foundation/Eastern Analytic Society conference, Nov. 16, 2005.

Insertable Imaging Device for Minimally Invasive Surgery", NYSTAR Technology forum, Oct. 14, 2005.

Automating the 3D modeling Pipeline, Leica HDS users forum, Nov. 3, 2005.

Automating the 3D modeling Pipeline, IBM T. J. Watson Research Lab Scientific Visualization Group, August 30, 2005. Nov. 3, 2005.

Seeing into the Past: New Digital Techniques for Archaeology, Fordham University CS Department 20th Anniversary symposium, April 15, 2005.

Automating the 3D Modeling Pipeline, University of Tokyo, CREST 3D modeling sympoisum, March 9, 2005.

Automating the 3D Modeling Pipeline, CITRIS Center, University of California, Berkeley, March 5, 2005.

Insertable Imaging and Effector Platforms for Robotic Surgery, Robotics and Nanotechnology in Surgery Cross Campus Grand Rounds, New York Presbyterian Hospital, Feb. 17, 2005.

Visualizing the Past: New Digital Techniques for Archaeology, CRA Snowbird conference, July 12, 2004.

Geometry and Texture Recovery of Scenes of Large Scale, SAC Capital Corporation, Distinguished Lecture Series, March 11, 2004.

From Robot Hands to Human Hands: A Visualization and Simulation Engine for Grasping Research, IGERT lecture, Dept. of Mechanical Engineering, Cornell University, April 15, 2004.

The Beauvais Cathedral Project, New Technologies and the Practice of Art History Workshop, Columbia University, April 24, 2003.

Geometry and Texture Recovery of Scenes of Large Scale, Distinguished Lecture Series, Mechanical Engineering Department, Drexel University, Feb. 28, 2003.

Geometry and Texture Recovery of Scenes of Large Scale, Distinguished Lecture Series, Computer Science Department, Johns Hopkins University, Nov. 14, 2002.

Geometry and Texture Recovery of Scenes of Large Scale, Computer Science Department, Stevens Institute of Technology, Oct. 28, 2002.

Computational Tools for Modeling, Visualizing and Analyzing Historic and Archaeological Sites, NSF DLI-2 Workshop, Portland, OR, July 18, 2002.

The AVENUE Automated Site Modeling Project: Geometry and Texture Recovery of Scenes of Large Scale, Computer Science Department, Brown University, February 28, 2002.

Geometry and Texture Recovery of Scenes of Large Scale, New York Academy of Science, February 27, 2002.

Laser Scanning Cool Objects: Stuffing Very Large Buildings into Computers, School of the Arts, Columbia University, December 6, 2001.

The Beauvais Cathedral Project, NSF Workshop on 3D Digital Imagery for Works of Art, Harvard University Art Museums, Cambridge, Mass. November 19-20, 2001.

The Beauvais Cathedral Project, Virtuial Heritage Colloquium, University of California, Berkeley, October 26, 2001.
Building Geometric and Photometric Correct 3-D Models, St. Joseph's College, April 20, 2001.

Building Geometric and Photometric Correct 3-D Models, IBM T. J. Watson Research Center, July 18, 2000.

Recovering the 3-D World, Workshop on Reality-based Modeling, San Francisco, April 28, 2000.

Building Geometric and Photometric Correct 3-D Models, University of British Columbia, March 13, 2000.

Building Geometric and Photometric Correct 3-D Models, Pennsylvania State University, Nov. 17, 1999.

Automatic 3-D Model Acquisition from Range Images, IEEE Mid Hudson Division, March 23, 1999.

Automatic 3-D Model Acquisition from Range Images, Philips Laboratories, March 1, 1999.

Automatic 3-D Model Acquisition from Range Images, Royal Institute of Technology, Stockholm, October 29, 1998

Integration of Vision, Force and Tactile Sensing for Grasping, Royal Institute of Technology, Stockholm, October 30, 1998

Sensor Planning for Robotics Tasks: Integrating Geometric, Optical and Motion Constraints, New York University, April 24, 1998.

Robotic Dextrous Manipulation, ONR Workshop on Human and Machine Haptics, Asilomar, CA, Dec. 8, 1998.

Sensor Planning for Robotics Tasks: Integrating Geometric, Optical and Motion Constraints, University of Pennslyvania, October 17, 1997.

Sensor Planning for Robotics Tasks: Integrating Geometric, Optical and Motion Constraints, NSF Workshop on Spatial Cognition, Ellicot City, MD, May 16, 1997.

Dynamic Sensor Planning, Philips Laboratories, November 6, 1996.

Visual Control for Robotic Hand-Eye Coordination (Keynote Speech), Robot Vision Workshop, IEEE Symposium on Signal Processing and Applications, Gold Coast, Australia, August 29, 1996.

Dynamic Sensor Planning, University of Rochester, September 22, 1995.

Closed Loop Visual Grasping and Manipulation, Intelligent Robots and Systems (IROS) Vision workshop, Pittsburgh, August 6, 1995.

Robotic Hand-Eye Coordination, Columbia Presbyterian Medical Center, April 6, 1995.

See Me, Feel Me, Touch Me: Hand-Eye Coordination for Robots, Rutgers University, May 25, 1994.

Visual Control of Grasping, IEEE VIsual Servoing Workshop, May 9, 1994, San Diego..

Real-Time Machine Vision, ARPA AVIS workshop, California Institute of Technology, March 22, 1994.

Calibration-Free Visual Servoing, Allerton Conference on Communications and Computers, Monticello, Illinois, Sep. 30, 1993.

See Me, Feel Me, Touch Me: Hand-Eye Coordination for Robots, New York Academy of Sciences, Nov. 10, 1993.

Model-Based Sensor Planning, University of Illinois, February 4, 1993.

Hand-Eye Coordination for Grasping, University of Rochester, April 27, 1992.

Using Hands and Eyes Together, Philips Laboratories, April 6, 1992.

Automated Tracking and Grasping of a Moving Object with a Robotic Hand-Eye System, University of Southern California, January 30, 1992.

Automated Tracking and Grasping of a Moving Object with a Robotic Hand-Eye System, New York University, November 27, 1991.

An Integrated System for Dexterous Manipulation, Rensselaer Polytechnic Institute, April 25, 1991.

Real-Time Visual Servoing for Dynamic Grasping, Yale University, March 6, 1991.

3-D Haptic Object Recognition, Brown University, November 20,1990.

See Me, Touch Me. Feel Me: Using Sensors with Robots, Philips Laboratories, October 19, 1990.

Real-Time Visual Servoing, New York University, October 5, 1990.

The MVP Machine Vision Planning System, Jet Propulsion Laboratory, California Institute of Technology, August 16, 1990.

The Japanese Space Robotics Program, Rockwell International Science Center, August 17, 1990.

Active Sensing with a Dexterous Robotic Hand, NATO Workshop on Sensors, Maratea, Italy, August 31, 1989.

An Integrated System for Dexterous Manipulation, University of Rochester, June 22, 1989.

Using Dexterous Robotic Hands, Stanford University, May 22, 1989.

Haptic Object Recognition, Siemens Research Laboratories, February 3, 1989.

An Integrated System for Dexterous Manipulation, University of Pennsylvania, January 17, 1989.

An Integrated System for Dexterous Manipulation, New York University, November 22, 1988.

Haptic Object Recognition Using a Multi-fingered Hand, AT&T Bell Laboratories, Murray Hill, NJ, September 28, 1988.

Research in Dexterous Manipulation, European Artificial Intelligence Conference, Dubrovnik, Yugoslavia, September 6, 1988.

Tactile Sensing, Canadian Association of Physicists, Montreal, May 19, 1988.

Vision and Robotics, IBM Manufacturing Technology Institute, May 18, 1988

Real-time Robotics, Oak Ridge National Laboratory, October 15, 1987.

3-D Modeling for Robotics, IBM T. J. Watson Research Laboratories, June 23, 1986.

Integration of Vision and Touch, General Electric Corporate Research and Development, June 17, 1986.

FUNDING

[1] 9/17 - 8/20, Scalable Multimodal Tactile Sensing for Robotic Manipulators in Manufacturing. co-PI, NSF, $750,000

[2] Visual-Tactile Integration for Reinforcement Learning, Google Faculty Research Award, $71K, SEAS

[3] 5/16 - 4/19, NSF National Robot Initiative, Multimodal Brain Computer Interface for Human-Robot Interaction, $736,552.00 (with P. Sajda)

[4] 1/17 - 12/17, SEAS SIRS program, A Multi-Modal Robotic Skin Sensor, $64,003 (with M.Ciocarlie and I. Kymissis).

[5] 5/16 - 5/17, Columbia Center for Learning and Technoogy, A Flipped laboratory for an Introductory Robtoics Course, $10,000.

[6] 1/16 - 8/16, New York State Spinal Cord Injury Research Board, Robotics for Ambulation and Assistance of Spinal Cord Injured, $337,218 (with Sunil Agrawal).

[7] 1/16 - 12/16, SEAS SIRS program, A Multi-Modal Robotic Skin Sensor, $64,003 (with M.Ciocarlie and I. Kymissis).

[8] 10/12 - 9/17: NSF National Robotics Initiative: Assistive Robotics for Grasping and Manipulation using novel Brain Computer Interfaces $784,998.

[9] 9/13 - 9/16: DARPA DURIP grant, Brain Computer Interface for Enhanced Interactions with Mobile Robot Agents, $202,500.

[10] 9/12 - 8/16: NSF Robust Intelligence Program: Dexterous Manipulation Using Predictive Thin-Shell Modeling, $498,000.

[11] 10/12 - 4/14: DARPA Robotics Challenge, $275,000.

[12] 9/12 - 8/14: Columbia CTV award: Surgical Structured Light System, $75,000.

[13] 12/11 - 6/13: Markerless Tool Tracking, Intuitive Surgical Inc., $60K. PI.

[14] 8/11 - 7/14: Shape Completion, Google Research Grant, $56K. PI.

[15] 7/10 - 12/11: Robust Extensible Autonomous Robot Nanipulation (REARM), DARPA ARM-S program, $182K. PI.

[16] 9/09 - 8/10: COBRA: Cooperative Bio-Inspired Remote-Manipulator Architecture, ONR/SPAWAR, Phase I, $70K, Co-PI.

[17] 7/09 - 6/12: Robotic Hands: Understanding and Implementing Adaptive Grasping, NSF RI medium grant, $930K, PI.

[18] 9/08: Columbia Grasp Database, Willow Garage unrestricted gift, $70K.

[19] 4/08: Semantically Searchable Dynamic 3D Databases, unrestricted gift, Google Research Award, $62K.

[20] 8/07 - 8/10: Image Guided In Vivo Tooling Platform for Minimal Access Surgery, NIH Image Guided Intervention program, $1.1M, Co-PI.

[21] 9/06 - 9/11: Cortical Control of a Dextrous Prosthetic Hand, NIH Biomedical Research Partnership, Co-PI, $750K.

[22] 6/06 - 5/08: Next Generation Imaging and Effector Platforms for Robotic Surgery, NYSTAR Technology Transfer Incentive Program, $750K

[23] 9/05 - 8/07: Insertable Imaging and Effector Platform for Surgery, NIH R21 grant, Co-PI, $275K.

[24] 9/1/04 - 8/31/06, Romanesque Architecture of the Bourbonnais: A Database, Mellon Foundation (co-PI), $60K.

[25] 6/1/03 - 5/31/06: A Robotics-Based Computational Environment to Simulate the Human Hand, NSF ITR(small),$332,991 (PI).

[26] 7/1/03 - 6/30/04: Next-Generation Surgical Imaging, NY State CAT, $89,000, (PI).

[27] 9/1/02 - 8/31/07: Pervasive Pixels, NSF CISE Infrastructure Grant, $1.2M (joint with CS faculty).

[28] 7/1/02 - 6/30/03: Next-Generation Surgical Imaging, NY State CAT, $83,000, (PI).

[29] 9/1/01 - 8/31/06: Computational Tools for Modeling, Visualizing and Analyzing Historic and Archaeological Sites, NSF ITR program, $2.0M (PI).

[30] 9/1/01 - 8/31/04: Infrastructure for Context-Aware Wireless Network Applications, NSF, $1.1 M (co-PI).

[31] 10/00 - 9/05: Structural Genomics of Eukaryotic Model Organisms, NIH, $150k/year.

[32] 4/95-7/00: Autonomous Sensor Systems for Manufacturing, $1M/year. ONR Multidisciplinary University Research Inititiative (MURI). Joint with 5 faculty.

[33] 7/99 - 7/04: Whitaker Foundation Development Award in Biomedical Engineering, $5M. Joint with 20 faculty.

[34] 3/98-3/01 Mobile Wireless Applications, DOD DURIP program, $166,000.

[35] 1/98 - 12/99 Mobile Robot Scanning System, NSF CISE Instrumentation Award, $86,077

[36] 9/96 - 9/01 NSF CISE Research Infrastructure Grant - Scalable Multimedia Information Processing, $2.8M. Joint with 12 CS faculty.

[37] 2/96 - 2/99: NSF Instrumentation Grant for Research in Computer and Information Science and Engineering: Acquisition of a Rapid Prototyping System - $61,334.

[38] 1/96 - 6/99: Whitaker Foundation Special Opportunity Award in Biomedical Engineering, $1M. Joint with 6 faculty.

[39] 5/95-5/98, Applied Machine Vision, DARPA AASERT Program, $152,000.

[40] 7/96-7/97 Computer-Assisted Control of Left Ventricular Assist Device (LVAD) to Repair Cardiac Function, $70,000. NYSSTF (CAT Program).

[41] 7/95-7/96: Computer-Assisted Control of Left Ventricular Assist Device (LVAD) to Repair Cardiac Function, $70,000. NYSSTF (CAT Program).

[42] 1/95-1/96: Equipment for Real-Time Visual Control. Defense University Research Innovation Program (DURIP), $85,000.

[43] 7/94-7/95: Computer-Assisted Control of Left Ventricular Assist Device (LVAD) to Repair Cardiac Function, $70,000. NYSSTF (CAT Program).

[44] 7/94-7/95, Research in Dextrous Manipulation, $15,000. Office of Naval Research.

[45] 1/94-1/96, NSF Combined Research-Curriculum Development In Technological Areas of National Importance program, focus area: Instructional Lab Modules for Machine Vision, $200,000.

[46] 6/94-12/97, Model-Based Sensor Planning, National Science Foundation, $294,000.

[47] 2/93-2/96, Applied Machine Vision, DARPA AASERT Program, $126,000.

[48] 10/93-11/95, Experimental Science Post Doctoral Position, National Science Foundation, $46,000.

[49] 4/92-4/95, DARPA Image Understanding Program, 2.7 million (3 years - joint with J. Kender, T. Boult, S. Nayar).

[50] 1/92, Toshiba Corporation. Gift of Flexible Micro Actuator robotic hand (approximate cost $25,000).

[51] 7/91, NSF CISE Grant, $3.8 million over 5 years, faculty participant.

[52] 10/91, Rockwell Inc., Research in Robotics, $20,000.

[53] 3/91, NSF Instrumentation Grant, Laser Range Finder, $50,000.

[54] 12/90, Siemens Corporation, Research in Robotics, $15,000.

[55] 12/90, Equipment Grant, Spatial Technologies Corporation, $65,000.

[56] 8/90, Rockwell Inc., Research in Robotics: $20,000.

[57] 7/89, Siemens Inc., Research in Robotics: $15,000.

[58] 7/89, Rockwell Inc., Research in Robotics: $20,000.

[59] 7/89, Philips Laboratories, Research in Robotics, $20,000.

[60] 3/89, National Science Foundation, Research in Dexterous Manipulation, $192,000

[61] 7/88, Philips Laboratories, Research in Robotics, $20,000.

[62] 5/88, National Science Foundation, Research Experience for Undergradautes, $8,000.

[63] 2/88, Rockwell Inc., equipment grant of a fiber optic tactile sensor: $10,000.

[64] 12/87 DARPA, Research in Artificial Intelligence, $1,600,000 per year for 3 years (shared with 5 faculty).

[65] 9/87, IBM Corporation, Research in Manufacturing Languages (joint with G. Kaiser): $32,038.

[66] 9/87, AT&T Foundation, Research in Dexterous Manipulation: $20,000.

[67] 5/87, NSF Presidential Young Investigator Award, $100,00 per year for 5 years.

[68] 3/87, NSF equipment grant for a Utah-MIT Dexterous robotic hand: $92,994.

[69] 8/86, NSF equipment grant for Masscomp real-time controller : $72,038.

TEACHING

Courses taught: Humanoid Robotics, Computational Aspects of Robotics, Columbia AI MOOC Robot Path Planning, Data Structures, 3-D Photography, Advanced 3D Modeling, Computational Control of Medical Instrumentation CAD-Based Machine Vision, Computer Vision, Advanced Robotics.

DOCTORAL STUDENTS

David Watkins, 3nd year, Ireti Akinola, 4rd year, Jake Varley, ‘‘Learning to Grasp’’, Ph.D. 2018; Yinxiao Li, ‘‘Grasping and Manipulation of Deformable Objects Using Predictive Thin-Shell Modeling’’, Ph.D. 2016, Jon Weisz, Ph.D. 2015, ‘‘Assistive Robotic Grasping’’; Austin Reiter, ‘‘Surgical Tool Tracking’’, Ph.D. 2013; Hao Dang, Tactile Sensing for Robotic Grasping, Ph.D. 2013; Corey Goldfeder, Ph.D. 2010, ‘‘Data driven Grasping’’; Matei Ciocarlie, Ph.D. 2009, ‘‘Low-Dimensional Robotic Grasping: Eigengrasp Subspaces and Optimized Underactuation’’; Paul Blaer, Ph.D. 2008, ‘‘View Planning for Automated Site Modeling’’; Alejandro Troccoli, Ph.D. 2006 (with distinction), ‘‘New methods and tools for 3D-modeling of large scale outdoor scenes using range and color images’’; Atanas Georguiev, Ph.D. 2002, ‘‘Design, Implementation and Localization of a Mobile Robot for Urban Site Modeling. Andrew Miller Ph.D. 2001, ‘‘GRASPIT! A Versatile Simualtor for Grasping’’. Ioannis Stamos, Ph.D. 2001, ‘‘Geometry and Texture Recovery of Scenes of Large Scale’’. Paul Oh, Ph.D. 1999, ‘‘Integraton of Joint Coupling for Visually Servoing a 5-DOF Hybrid Robot’’. Michael Reed, Ph.D. 1998, ‘‘Solid Model Acquisition from Range Imagery’’. Steven Abrams, Ph.D. 1997, ‘‘Sensor Planning in an Active Robot Work-cell’’. Billibon Yoshimi, Ph.D. 1995, ‘‘Visual Control of Robotics Tasks’’. Paul Michelman, Ph.D. 1993, ‘‘Tool Usage with a Dexterous Hand’’. Alexander Timcenko, Ph.D 1993, ‘‘Modeling Uncertainty in Robotics’’. Konstantinos Tarabanis, Ph.D. 1991, ‘‘Model Based Sensor Planning for Robotics’’. Kenneth Roberts, Ph.D. 1991, ‘‘Object Recognition with a Robotic Hand’’. Ajit Singh, Ph.D. 1990, ‘‘An Estimation-Theoretic Framework for Image-

Flow Computation''.

MASTERS STUDENTS

Shashwat Verma 2020, Bohan Wu 2020, Wei Zhang 2019,Feng Xu 2019,Zizhao Wang 2019, Boyuan Chen, 2017, Jorge Guerra, 2016, Alexander Sigaras 2013, Ji Wang 2012, Ryan Chen, 2012, Konstantinos Iliopoulos, 2012. Wei-Chuan Yuan, MS 2011. Kaushik Viswanathan, MS 2011. Hao Dang, MS 2009. Tejas Nadkarni, MS 2008. Benjamin Smith, MS 2004. Ethan Gold, ''AvenueUI: A Comprehensive Visualization/Teleoperation Application and Development Framework for Multiple Mobile Robots'', 2001. Hong Ray Chao, ''Visual Control of Stewart Platform for Robotic Surgery'', 1999. Zoran Lazarevic, ''Feasibility of a Stewart Platform with Fixed Actuators as a Platform for CABG Surgery Device'', 1997. Sanjay Aiyagari, ''Control of 5-DOF Robot Gantry'', 1995. Tim Jones, M.S. ''Virtual Vision Laboratory'', 1995. Thomas Magdahl, ''Real-Time Controller for FMA Hand'', 1993. Abdullah Alhussain, ''CAD Modeling and Recognition using a Range Finder'', 1993. Michael Reed, ''Object Recognition and Pose Detection'', 1992. Shriram Krishnan, ''Calibration of a Multi-Fingered Dextrous Hand'', 1991. Amy Morishima, ''Lexical Analysis of Hand Positions'', 1989. Michelle Emanuel, ''Graphical User Interface for Solid Object Modeling'', 1988. Thomas Gefell, ''Object Classification using Tactile Sensing'', 1988. Takahisha Ishizuka, ''Tool Extension in an ALOE Editor'', 1988. Peter Armstrong, ''Tactile Sensing on the Utah-MIT Hand'', 1988. Keith Weldon, ''Coordinated Control of a SCARA Robotic Arm'', 1988. Mary Walsh, ''Graphics Library for Masscomp Processor'', 1987. Lin Fai Whu, ''Real-Time Host Interface to Parallel Image Procesor'', 1987.

PATENTS

US patent 9,730,761 issued Aug. 15, 2017, "Insertable device and system for minimal access procedure"

U.S Patent 9,418,442 ''Tool Tracking During Surgical Procedures'', August 16, 2016.

U.S Patent 9,393,076 ''Insertable Device and System for Minimal Access Procedure'', July 19, 2016.

U.S. Patent 8,810,638 Insertable surgical imaging device, Aug. 19, 2014.

U.S. Patent 8,096,941 Insertable device and system for minimal access procedure, Jan. 7, 2012.

U.S Patent 7,066,879: ''Insertable Device and System for Minimal Access Procedure'', June 27, 2006.

U.S. Patent 6,249,600: ''System and Method for Generation of a Three-Dimensional Solid Model'', June 19, 2001.

BOOKS

Whittaker, W., T. Kanade, P. K. Allen, A. K. Bejzcy, J. W. Lowrie, H. G. McCain, M. D. Montemerlo, T. B. Sheridan, *Space Robotics in Japan*, Japanese Technology Evaluaton Center, January 1991.

Allen, Peter *Robotic object recognition using vision and touch*, Kluwer Academic Publishing, 1987.

BOOK CHAPTERS

Robert Ying, Jon Weisz, and Peter K. Allen, Grasping with your Face, Springer Proceedings in Advanced Robotics, Vol. 2, Wolfram Burgard and Antonio Bicchi (Eds): ROBOTICS RESEARCH, 978-3-319-51531-1, 416128_1_En (20)

Peter K. Allen, Matei Ciocarlie, and Corey Goldfeder, Grasp Planning Using Low Dimensional Subspaces, in The Human Hand: A Source of Inspiration for Robotic Hands, Springer Tracts in Advanced Robotics, 2014, (STAR) series, Balasubramanian, R. and Santos, V.J., Eds., Springer, Heidelberg.

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