

CURRICULUM VITAE

Dov Katz

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Education

- Postdoc **Computer Vision & Machine Learning**, Carnegie Mellon University, March 2012
- Ph.D. **Computer Science**, University of Massachusetts Amherst, September 2011
- M.Sc. **Computer Science**, University of Massachusetts Amherst, May 2008
- B.Sc. **Computer Science and Electrical Engineering**, Tel-Aviv University, May 2004

Professional and Research Experience

Founder, Minerva Technologies 2017-Present

Developing innovative computer vision and machine learning algorithms to disrupt the brick & mortar shopping and checkout experience.

Head of Computer Vision, Oculus/Facebook 2013-2017

Led Oculus' computer vision and machine learning R&D group (about 80 engineers, scientist and managers). Managed multiple M&A activities, defined product strategy, created independent high throughput teams, shipped exciting technologies to consumers.

Senior Computer Vision Engineer, Oculus VR 2012-2013

Led Oculus' computer vision R&D. Designed, developed and shipped a high accuracy and low latency position tracking system. Involved in camera design, driver and interface implementation. Participated in manufacturing efforts.

Postdoctoral Fellow, Carnegie Mellon University 2011-2012

Conducted research in autonomous mobile manipulation with focus on perception in unstructured environments. Developed state-of-the-art perception algorithms for detecting, tracking and modeling novel objects (natural and man-made). Integrated machine-learning methods to enable lifelong learning of robotic perception and manipulation skills.

- Research Assistant**, Technical University of Berlin 2009-2011
Designed and supervised the implementation of a new robotic platform. Led a team of PhD students in the design of a new software library. Involved in hiring decisions.
- Research Assistant**, University of Massachusetts Amherst 2005-2009
Conducted various research projects on autonomous mobile manipulation in the robotics research lab.
- Research Assistant**, Tel-Aviv University 2003-2004
Led a research project on matching emotional states with facial expression using computer vision, in the research group of Prof. Messer-Yaron.
- Software Engineer**, Zend Technologies 2000-2005
Directed the design and implementation of software packaging on multiple operating systems for the leading web scripting language PHP.

Teaching Experience

Interactive Perception seminar, Carnegie Mellon University 2012-2013

Founded the Carnegie Mellon University seminar on interactive perception. Organized the seminar, invited speakers, presented relevant research, initiated discussion, and encouraged collaboration.

Research supervisor, Technical University of Berlin 2009-2011

Supervised B.Sc. and M.Sc. theses. Selected research topics and guided the students throughout their research and writing.

Research Experience for Undergraduates Supervisor, University of Massachusetts Amherst 2006-2009

Led the research of a team of undergraduates and instructed them in various computer science topics related to their research.

Teaching Assistant, University of Massachusetts Amherst 2005-2006

Held office hours, prepared and graded homework and exams.

Honors and Awards

CES Best of show award for Oculus Rift position tracking prototype	2014
IEEE Robotics and Automation Society Most Active Technical Committee Award	2010-2011
Outstanding Masters Project (funded by Yahoo!)	2008
Passed PhD qualifying portfolio with distinction (awarded to 1-2 candidates per year)	2008
Best Manipulation Paper finalist IEEE International Conference on Robotics and Automation (ICRA)	2008
Travel Grant IEEE International Conference on Robotics and Automation (ICRA)	2008
Travel Grant Robotics: Science and Systems (RSS)	2008
Distinguished Undergraduate Research Award Tel-Aviv University	2004

Book Chapters

Dov Katz and Oliver Brock

Interactive Perception of Articulated Objects

In Experimental Robotics (Springer Tracts in Advanced Robotics), Volume 79

Oussama Khatib, Vijay Kumer and Gaurav Sukhatme (editors), Springer, February 2013

Robert Gaschler, Dov Katz, Martin Grund, Peter A. Frensch and Oliver Brock

Intelligent Object Exploration

In Human Machine Interaction - Getting Closer

ISBN: 978-953-307-890-8, January 2012

Dov Katz and Oliver Brock

A Factorization Approach to Manipulation in Unstructured Environments

In Robotics Research (Springer Tracts in Advanced Robotics)

Cedric Pradlier, Roland Siegwart and Gerhard Hirzinger (editors), Springer, June 2011

Dov Katz and Oliver Brock

Extracting Planar Kinematic Models Using Interactive Perception

In From Features to Actions: Unifying Perspectives In Computational and Robot Vision

Danica Kragic, Ville Kyrki (editors), Springer Verlag, June 2008

Refereed Journals

Dov Katz, Arun Venkatraman, Moslem Kazemi, J. Andrew Bagnell, Anthony Stentz
Perceiving, learning and exploiting object affordances for autonomous pile manipulation
Autonomous Robots 37(4): 369-382 (2014)

Dov Katz and Oliver Brock

Learning to Manipulate Planar Articulated Objects

In IEEE Transactions on Robotics (under review)

Dov Katz, Moslem Kazemi, J. Andrew Bagnell, Oliver Brock and Anthony Stentz

Three-Dimensional Interactive Perception

In IEEE Transactions on Robotics (under review)

Dov Katz and Oliver Brock

A Critical Look at Mobile Manipulation

In Foundations and Trends in Robotics

Oliver Brock, Dov Katz and Siddhartha S. Srinivasa

Mobile Manipulation (From the Guest Editors)

In IEEE Robotics & Automation Magazine 19(2):18-19, 2012

Refereed Conferences

Dov Katz, Arun Venkatraman, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz
Perceiving, Learning, and Exploiting Object Affordances for Autonomous Pile Manipulation
In Proceedings of Robotics: Science and Systems, Berlin, Germany, June 2013

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz
Interactive Segmentation, Tracking, and Kinematic Modeling of Unknown 3D Articulated Objects
In IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 2013

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz
Semi-Autonomous Manipulation of Natural Objects in Clutter
In IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 2013

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz
Autonomous Pile Clearing using Interactive Perception
In IEEE International Conference on Robotics and Automation, Karlsruhe, Germany, May 2013

Dov Katz, Oliver Brock and Andreas Orthey
Interactive Perception of Articulated Objects
In the 12th International Symposium of Experimental Robotics (ISER), India, December 2010

Dov Katz and Oliver Brock
A Factorization Approach to Manipulation in Unstructured Environments
In the 14th International Symposium of Robotics Research (ISRR) 2009

Dov Katz, Yuri Pyuro and Oliver Brock
Learning to Manipulate Articulated Objects in Unstructured Environments Using a Grounded Relational Representation
In Proceedings of Robotics: Science and Systems, Zurich, Switzerland, June 2008

Dov Katz and Oliver Brock
Manipulating Articulated Objects With Interactive Perception
In Proceedings of the IEEE International Conference on Robotics and Automation, Pasadena, CA, USA, May 2008 (*Best Manipulation Paper finalist*)

David G. Cooper, Dov Katz and Hava T. Siegelmann

Emotional Robotics: Tug of War

In the AAI 2008 Spring Symposium on Emotion, Personality, and Social Behavior, 2008

Refereed Workshops

Dov Katz and Oliver Brock

Interactive Segmentation of Articulated Objects in 3D

In Workshop on Mobile Manipulation: Integrating Perception and Manipulation at the IEEE International Conference on Robotics and Automation 2011, Shanghai, China, May 2011

Dov Katz, Jacqueline Kenney and Oliver Brock

How Can Robots Succeed in Unstructured Environments?

In Workshop on Robot Manipulation: Intelligence in Human Environments at Robotics: Science and Systems, Zurich, Switzerland, June 2008

Dov Katz and Oliver Brock

Extracting Planar Kinematic Models Using Interactive Perception

In Workshop on Robot Manipulation: Sensing and Adapting to the Real World at Robotics: Science and Systems, Atlanta, USA, June 2007

Dov Katz and Oliver Brock

Interactive Perception: Closing the Gap Between Action and Perception

In Workshop: From features to actions: unifying perspectives in computational and robot vision at the IEEE International Conference on Robotics and Automation, Rome, Italy, April 2007

Dov Katz, Emily Horrell, Yuandong Yang, Brendan Burns, Thomas Buckley, Anna Grishkan, Volodymyr Zhylkovskyy, Oliver Brock, and Erik Learned-Miller

The UMass Mobile Manipulator UMan: An Experimental Platform for Autonomous Mobile Manipulation

In Workshop on Manipulation in Human Environments at Robotics: Science and Systems, Philadelphia, USA, August 2006

Technical Reports

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz

Interactive Segmentation, Tracking, and Kinematic Modeling of Unknown Articulated

Objects Tech report CMU-RI-TR-12-06, Robotics Institute, Carnegie Mellon University, March 2012

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz

Semi-Autonomous Manipulation of Natural Objects

Tech report CMU-RI-TR-12-33, Robotics Institute, Carnegie Mellon University, November 2012

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz

Clearing a Pile of Unknown Objects using Interactive Perception

Tech report CMU-RI-TR-12-34, Robotics Institute, Carnegie Mellon University, November 2012

Refereed Posters

Dov Katz and J. Andrew Bagnell

Life-long Learning of Manipulation Expertise

Intel's University Collaboration Office Showcase, Santa Clara, CA, June 2012

Dov Katz, Moslem Kazemi, J. Andrew Bagnell and Anthony Stentz

Interactive Segmentation, Tracking, and Kinematic Modeling of Unknown Articulated

Objects International Workshop on Point Cloud Processing at IEEE conference on Computer Vision and Pattern Recognition (CVPR), RI, June 2012

Dov Katz and Oliver Brock

Learning to Model Articulated Objects in Unstructured Environments

In Workshop on Robotics Challenges for Machine Learning II at IEEE/RSJ 2008 International Conference on Intelligent Robots and Systems, Nice, France, September 2008

Presentations

Autonomous Manipulation. VASC Seminar, Carnegie Mellon University, Pittsburgh, PA, USA, November 5th, 2012

Interactive Perception of Articulated Objects for Autonomous Manipulation. Ph.D. Defense, Amherst, MA, USA, July 1st, 2011

Interactive Perception of Articulated Objects. In the Interaction Modeling Intelligence lab lecture series, Berlin, Germany, June 2011

Interactive Segmentation of Articulated Objects in 3D. In ICRA 2011 Workshop on Mobile Manipulation: Integrating Perception and Manipulation, Shanghai, China, May 2011

Proposal for a new IEEE/RAS Technical Committee on Mobile Manipulation. In ICRA 2010, Anchorage, AK, May 2010.

Mobile Manipulation in Unstructured Environments. In workshop on mobile manipulation at the American Association for Artificial Intelligence (AAAI) 2008 Chicago, USA, July 2008

Learning to Manipulate Articulated Objects in Unstructured Environments Using a Grounded Relational Representation. In Robotics: Science and Systems, Zurich, Switzerland, June 2008

Extracting Planar Kinematic Models Using Interactive Perception. In Workshop: Robot Manipulation: Sensing and Adapting to the Real World at Robotics: Science and Systems, Atlanta, USA, June 2007

Extracting Planar Kinematic Models Using Interactive Perception. In New England Manipulation Symposium (NEMS), Troy, NY, USA, June 2007

The UMass Mobile Manipulator UMan: An Experimental Platform for Autonomous Mobile Manipulation. In Workshop on Manipulation in Human Environments, at Robotics: Science and Systems, Philadelphia, USA, August 2006

Community Service

Guest editor: Special issue of the IEEE Robotics and Automation Magazine on Mobile Manipulation

Co-chair and founder: IEEE/RAS Technical Committee on Mobile Manipulation (<http://mobilemanipulation.org>)

Co-organizer: ICRA Mobile Manipulation workshops series

Co-organizer: RSS Mobile Manipulation workshops

Reviewer: Association for the Advancement of Artificial Intelligence

Program committee: Association for the Advancement of Artificial Intelligence (AAAI)

Reviewer: Robotics: Science and Systems (RSS)

Reviewer: IEEE International Conference on Robotics and Automation (ICRA)

Reviewer: IEEE International Conference on Humanoid Robots

Reviewer: IEEE International Conference on Development and Learning (ICDL)

Reviewer: Journal of Robotics and Autonomous System

Reviewer: International Journal of Robotics Research

Scientific Software

Dov Katz, Clemens Eppner, and Georgios Fagogenis

TU Robotics Software Library (RS)

C++ software for control, motion planning, manipulation and grasping. The library provides both simulation and real-time capabilities for multiple robotic platforms.

Dov Katz, Yuandong Yang, Filip Jagodzinski, and Brendan Burns

The UMass Amherst Robotics Software (URS, <http://robotics.cs.umass.edu/ursdocs>)

C++ software library for autonomous mobile manipulation and protein docking.

Dov Katz and Sagi Perel

Hebrew Programming Language (HPL, <http://hpl.sourceforge.net>)

C++ implementation of a Hebrew scripting language.

Patents

Title	Patent Number	Date of Patent
Face and eye tracking using facial sensors within a head-mounted display	9959678	May 1, 2018
Rolling shutter blur reduction using motion data	9854170	December 26, 2017
Stereo-based calibration apparatus	9805512	October 31, 2017
Calibration of virtual reality systems	9779540	October 3, 2017
Calibration of multiple rigid bodies in a virtual reality system	9600925	March 21, 2017
Calibration of virtual reality systems	9524580	December 20, 2016
Facial animation using facial sensors within a head-mounted display (pending)	20170352178	December 7, 2017
Tracking portions of a user's face uncovered by a head mounted display worn by the user (pending)	20170287194	October 5, 2017
Non-overlapped stereo imaging for virtual reality headset tracking (pending)	20170192232	July 6, 2017
Hand-Held Controllers with Light-Emitting Diodes Synchronized to an External Camera (pending)	20160364910	December 15, 2016
Tracking Controllers of a Virtual Reality System (pending)	20160364013	December 15, 2016
Sparse projection for a virtual reality system (pending)	20160259168	September 8, 2016