Tomasz Malisiewicz

Email: tomasz@csail.mit.edu
Web: http://people.csail.mit.edu/tomasz/

Office: 32-D542
32 Vassar Street
Cambridge, MA 02139

Research Interests

My research focuses on building visual image understanding systems which can be used for robotic applications as well as organizing large online photo collections. A key goal of my research is to advance the state-of-the-art in visual object detection on real-world problems while utilizing ideas from machine learning, software engineering and psychology.

Education

Carnegie Mellon University, Pittsburgh PA   08/2005 - 08/2011
Ph.D in Robotics
Advisor: Alexei A. Efros
Thesis: Exemplar-based Representations for Object Detection, Association and Beyond

Carnegie Mellon University, Pittsburgh PA   08/2005 - 12/2008
MS in Robotics (GPA 4.00)

Rensselaer Polytechnic Institute, Troy NY   08/2001 - 05/2005
B.S. Computer Science and Physics Dual Major & Math Minor (GPA 4.00)

Research Experience

CSAIL, Massachusetts Institute of Technology, Cambridge MA   09/2011 - current
Postdoctoral Research Associate
- Large-scale recognition and learning using videos
- 3D reconstruction using RGB-D sensors and recognition on mobile devices
- Working under the supervision of Antonio Torralba

Robotics Institute, Carnegie Mellon University   08/2005 - 08/2011
Graduate Research Assistant
- Developed object recognition and image segmentation algorithms
- Open sourced Exemplar-SVM framework for object detection: Exemplar-SVM on github
- Developed Visual Memex approach for reasoning about object relationships

Google, Mountain View CA   06/2009 - 09/2009
Software Engineering Intern in Computer Vision Research Group
- Discriminative Group Sparse Coding for Image Classification
- Worked under the supervision of Dr. Dennis Strelow

Google, Mountain View CA   06/2008 - 09/2008
Software Engineering Intern in Computer Vision Research Group
- Large Scale Segmentation and Recognition via MapReduce
- Worked under the supervision of Dr. Thomas Leung

École Normale Supérieure, Paris, France   03/2008 - 05/2008
Visiting Student Researcher in Willow Research Group
- Hosted by Prof. Jean Ponce and Prof. Andrew Zisserman

Rensselaer Polytechnic Institute Computer Science Department   05/2004 - 05/2005
Undergraduate Research Assistant - Range Data Registration
- Development of range data registration algorithms in C++
- Worked under the supervision of Charles Stewart

Rensselaer Polytechnic Institute Computer Science Department   05/2003 - 09/2003
Undergraduate Research Project - Retinal Image Segmentation
- Cross-Platform Software Engineering using CMake
- Medical Imaging/Image Processing using VXL/ITK C++ Libraries/Toolkits

Brookhaven National Laboratory, Upton NY   06/2002 - 09/2002
Energy Research Undergraduate Laboratory Fellowship
- Modeled Relativistic Muons in Electromagnetic Rings via Object Oriented Techniques
- Studied Numerical Solutions to Partial Differential Equations

Teaching Experience

Skolkovo Tech Innovation Workshop at MIT   08/2012 and 08/2013
Computer Vision Technology Consultant
- Helped students get familiar with state-of-the-art object detection techniques
- Consulted two teams using computer vision technology for their final project

Robotics Institute, Carnegie Mellon University   01/2009 - 05/2009
Graduate Teaching Assistant - Learning Based Methods in Vision (Taught by Alexei Efros)

Robotics Institute, Carnegie Mellon University   08/2006 - 12/2006
Graduate Teaching Assistant - Graduate Computer Vision (Taught by Martial Hebert)

Rensselaer Polytechnic Institute CS Dept   01/2004 - 05/2004, 01/2003-05/2003
Undergraduate Teaching Assistant - Computer Science II

Rensselaer Polytechnic Institute CS Dept   09/2003 - 12/2003
Undergraduate Teaching Assistant - Data Structures and Algorithms

Rensselaer Polytechnic Institute, Advising and Learning Center   09/2001 - 05/2002
Tutor - Computer Science, Physics, Calculus

Publications

C. Vondrick, A. Khosla, T. Malisiewicz, A. Torralba. "HOGgles: Visualizing Object Detection Features". In ICCV, December 2013.

A. Khosla, T. Zhou, T. Malisiewicz, A. A. Efros, A. Torralba. "Undoing the Damage of Dataset Bias". In ECCV, October 2012.

T. Malisiewicz, A. Shrivastava, A. Gupta, and A. A. Efros. "Exemplar-SVMs for Visual Object Detection, Label Transfer and Image Retrieval. Extended Abstract, ICML, July 2012.

A. Shrivastava, T. Malisiewicz, A. Gupta, A. A. Efros. "Data-driven Visual Similarity for Cross-domain Image Matching." In SIGGRAPH ASIA, December 2011.

T. Malisiewicz, A.Gupta, A. A. Efros. "Ensemble of Exemplar-SVMs for Object Detection and Beyond." In ICCV, November 2011.

T. Malisiewicz, A. A. Efros. "Beyond Categories: The Visual Memex Model for Reasoning About Object Relationships." In NIPS, December 2009.

T. Malisiewicz, A. A. Efros. "Recognition by Association via Learning Per-exemplar Distances." In CVPR, June 2008.

T. Malisiewicz, A. A. Efros. "Improving Spatial Support for Objects via Multiple Segmentations." In BMVC, September 2007.

B. King, T. Malisiewicz, C. Stewart, R. Radke. "Registration of Multiple Range Scans as a Location Recognition Problem: Hypothesis Generation, Refinement and Verification." In 3DIM, June 2005.

Technical Reports

C. Vondrick, A. Khosla, T. Malisiewicz and A. Torralba. "Inverting and Visualizing Features for Object Detection. arXiv Technical Report. December, 2012.

M. Gharbi, T. Malisiewicz, S. Paris and F. Durand. "A Gaussian Approximation of Feature Space for Fast Image Similarity". MIT CSAIL Technical Report, October 2012.

T. Malisiewicz "Exemplar-based Representations for Object Detection, Association and Beyond" CMU PhD Thesis, August 2011.

T. Malisiewicz, J. C. Huang and A. A. Efros, "Detecting Objects via Multiple Segmentations and Latent Topic Models" CMU Technical Report, 2006.

J. C. Huang and T. Malisiewicz "Fitting a Hierarchical Logistic Normal Distribution" CMU Technical Report, 2006.

Invited Talks

Exemplar-SVMs for Visual Image Matching and Object Detection
Google Research, Mountain View, CA   May 8, 2013
Brown University, Department of Computer Science   April 30, 2013

Exemplar-SVMs for Visual Object Detection, Label Transfer and Image Retrieval
MIT Lincoln Labs, LISC Seminar   July 20, 2012
ICML 2012 Invited Applications Talk   June 29, 2012
Boston University, School of Computer Science   April 12, 2012

Data-driven Visual Similarity for Cross-domain Image Matching
Large Scale Multimedia Search Workshop, IPAM/UCLA   January 9, 2012
MIT Graphics Group Seminar   December 7, 2011

Per-exemplar learning: Object Detection and Beyond
Kernels and Distances Workshop, ICCV 2011   November 13, 2011

Ensemble of Exemplar-SVMs for Object Detection and Beyond
MIT Computer Vision Group Seminar   September 20, 2011

Recognizing and Interpreting Objects with the Visual Memex
PhD Thesis Defense, Carnegie Mellon University   August 8, 2011

Recognition by Association
CMU Machine Learning Department Learning Lunch   October 27, 2008
Berkeley Computer Vision Seminar   September 2, 2008
CMU VASC Seminar   May 12, 2008
Oxford Computer Vision Workshop   April 11, 2008

Improving Spatial Support for Objects via Multiple Segmentations
British Machine Vision Conference   September 12, 2007

Computing Skills
    Languages: C/C++ (12+ years), Matlab (8+ years), Java, Javascript, LaTeX
    Systems: Strong Linux/Unix Skills, Mac OS X, Windows, MapReduce

Academic Activities
    Reviewer for CVPR, ICCV, ECCV, NIPS, PAMI, IJCV, AAAI, ICML, SIGGRAPH ASIA

Awards

National Science Foundation Graduate Research Fellowship	2006-2009
Rensselaer Polytechnic Institute Alumni Scholarship	08/2001
Rensselaer Polytechnic Institute Mathematics/Science Medal Scholarship	05/2000
Valedictorian of High School (550+ students)	06/2001
National Physics Team Semifinalist (approx 180 students in USA)	05/2001

References

Alexei (Alyosha) Efros, Finmeccanica Associate Professor
The Robotics Institute and Computer Science Department
School of Computer Science
Carnegie Mellon University
(412) 268-1234
efros@cs.cmu.edu

Antonio Torralba, Associate Professor
Computer Science and Artificial Intelligence Laboratory
Department of Electrical Engineering and Computer Science
Massachusetts Institute of Technology
(617) 324-0900
torralba@csail.mit.edu

Martial Hebert, Professor
The Robotics Institute
School of Computer Science
Carnegie Mellon University
(412) 268-2585
hebert@ri.cmu.edu

Abhinav Gupta, Assistant Research Professor
The Robotics Institute
School of Computer Science
Carnegie Mellon University
(412) 268-2067
abhinavg@cs.cmu.edu