

Alex Leykin

Tel: 812-219-6672

oleykin@indiana.edu
<http://cgi.cs.indiana.edu/~oleykin>

Education

- 2007 ✓ PhD in Computer Science, Indiana University
- 2002 ✓ MS in Computer Science, Indiana University
- 2000 ✓ MS in Computer Science, Kharkiv Polytechnical Institute, Ukraine
- 1998 ✓ BS in Computer Science and Applied Mathematics, Kharkiv Polytechnical Institute, Ukraine

Research Interests

- ✓ Group activity recognition from video by swarm modeling of group behaviors.
- ✓ Visual attention, saliency and clutter. Estimating where people look and how visual characteristics of objects affect their visual search tasks.
- ✓ Visual tracking from panoramic videos of cluttered scenes. Tracking by thermal and color sensor fusion.
- ✓ Recently I was also involved in projects for autonomous vision guided navigation, semantic level image classification, text readability and texture analysis for human computer interaction.

Professional Experience

- Dec 2007-... ✓ **Postdoctoral Research Fellow, Customer Interface Lab, Kelley School of Business, Indiana University:** Research focus: Computer vision algorithms for collecting and analyzing marketing intelligence data in retail contexts. Visual tracking and activity recognition from videos applied to retail environments. Main project: Automated analysis of visual attention and goal oriented search strategies in human vision.
- 2008-... ✓ **Adjunct Research Scientist, 2008-present, Department of Computer Science, Indiana University:** Collaborating with robotics faculty on obstacle detection for autonomous navigation system.
- 2005-2007 ✓ **Research Assistant, Kelley School of Business, Indiana University:** Customer tracking and activity analysis in retail stores. Developing methods and software implementations for real-time human body tracking. Extracting statistical measures of individual customer and group activities to aid marketing analysis. Platform: C++, .NET, OpenCV
- 2003 ✓ **Research Assistant, Dept. of CIS, Indiana University-Purdue University Indianapolis:** Text readability analysis for augmented reality. Sampled readability measures through human-subject experiments. Trained an SVM classifier on human data for assessing the readability of text over the textured monochromatic backgrounds. Classifier operated on automatically extracted texture and contrast features. Platform: Matlab 7
- 2001-2002 ✓ **Research Assistant, AI Group, Dept. of CS, Indiana University:** Machine vision, image processing algorithms, simulating human behavior to automatically differentiate photographs of real scenes from art. In-depth analysis of edge, color and texture properties resulted in an automated “conglomerate of neural networks” image classifier. Platform: Matlab 6.1
- 2001 ✓ **Project Developer, Information In Place, Inc:** Mixed reality project development. Worked on the driver to retrieve object coordinates from the database and to match them with the real coordinates provided by the GPS (Global Positioning System) system. Platform: Java and Java3D visualization package.

Teaching Experience

- 2002-2004** ✓ **Lecturer: Introduction to Programming II (Java)** - advanced programming concepts, object-oriented programming, networking, graphical interfaces
- 2004** ✓ **Associate Instructor: Introduction to Programming II (Python)** - text and argument parsing techniques, graphical interfaces
- 2002** ✓ **Associate Instructor: Mastering the World Wide Web** - web server setup and administration, database management, process scheduling, Perl/CGI, Java Servlets
- 2001** ✓ **Associate Instructor: Introduction to Programming I (Java)** - fundamental programming techniques, general problem-solving techniques, emphasis on modular programming, user-interface design, and developing good programming style.
- 2001** ✓ **Associate Instructor: Introduction to Computer Science (Scheme)** - introduction to programming and algorithm design and analysis
- 2000** ✓ **Associate Instructor: Introduction to Computers and Computing** - introductory non-major course on problem solving techniques, office products, computing concepts

Professional Service

- 2008-** ✓ **Reviewer: Eurographics: Annual Conference of the European Association for Computer Graphics**
- 2008-** ✓ **Reviewer: IEEE Transactions on Intelligent Transportation Systems**

Presentations and Talks

- July 2008** ✓ CVPR 2008, Anchorage, AK, Alex Leykin and Riad Hammoud "Real-Time Estimation of Human Attention Field in LWIR and Color Surveillance Videos"
- Dec 2007** ✓ Networks and Complex Systems Talk Series, Bloomington, IN, Ray Burke and Alex Leykin "Automated Customer Tracking and Behavior Recognition"
- Nov 2007** ✓ KEP Workshop (Kelley School of Business), Indianapolis, IN, Alex Leykin and Ray Burke "Automated Analysis of Retail Customer Spatial Interactions"
- July 2007** ✓ CVPR 2007, Minneapolis, MN, Alex Leykin, Yang Ran and Riad Hammoud "Thermal-Visible Video Fusion for Moving Target Tracking and Pedestrian Classification"
- July 2006** ✓ CVPR 2006, New York, NY "Robust Multi-Pedestrian Tracking in Thermal-Visible Surveillance Videos"
- September 2005** ✓ Human Activity Recognition and Modelling Workshop, Oxford, UK "A vision system for automated customer tracking for marketing analysis: Low level feature extraction"
- September 2004** ✓ British Machine Vision Conference, London, UK "Using multiple views to resolve human body tracking ambiguities"

Publications

- ✓ Alex Leykin, and Riad Hammoud “Pedestrian tracking by fusion of thermal-visible surveillance videos”, *Springer, Machine Vision and Applications (MVA)*, 2008.
- ✓ Alex Leykin, and Riad Hammoud “Real-Time Estimation of Human Attention Field in LWIR and Color Surveillance Videos”, *Object Tracking and Classification in and Beyond the Visible Spectrum (CVPRW)*, 2008.
- ✓ Yang Ran, Alex Leykin, and Riad Hammoud, “Thermal-Visible Video Fusion for Moving Target Tracking and Pedestrian Motion Analysis and Classification”, chapter in Springer, *Augmented Vision Perception in Infrared Algorithms and Applied Systems: Advances in Pattern Recognition*, 2008
- ✓ Alex Leykin “Visual Human Tracking and Group Activity Analysis: A Video Mining System for Retail Marketing”, PhD Thesis, 2007
- ✓ Alex Leykin and Mihran Tuceryan “Detecting Shopper Groups in Video Sequences”, *Advanced Video and Signal based Surveillance (AVSS)*, 2007.
- ✓ Alex Leykin and Yang Ran and Riad Hammoud “Thermal-Visible Video Fusion for Moving Target Tracking and Pedestrian Classification”, *Object Tracking and Classification in and Beyond the Visible Spectrum (CVPR-W)*, 2007.
- ✓ Alex Leykin and Riad Hammoud “Robust Multi-Pedestrian Tracking in Thermal-Visible Surveillance Videos”, *Object Tracking and Classification in and Beyond the Visible Spectrum (CVPR-W)*, 2006
- ✓ Florin Cutzu, Riad Hammoud, and Alex Leykin “Distinguishing paintings from photographs”, *Computer Vision and Image Understanding (CVIU)*, 100(3), pp. 249-273, 2005.
- ✓ Florin Cutzu, Riad Hammoud, and Alex Leykin “Estimating the photorealism of images: Distinguishing paintings from photographs”, *International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2003.
- ✓ Alex Leykin and Florin Cutzu “Differences of edge properties in photographs and paintings”, *International Conference on Image Processing (ICIP)*, 2003.
- ✓ Alex Leykin, Florin Cutzu, and Mihran Tuceryan “Using multiple views to resolve human body tracking ambiguities”, *British Machine Vision Conference (BMVC)*, 2004.
- ✓ Alex Leykin and Mihran Tuceryan “Determining text readability over textured backgrounds in augmented reality systems”, *Virtual Reality Continuum and its Applications in Industry (VRCIAI)*, 2004.
- ✓ Alex Leykin and Mihran Tuceryan “A vision system for automated customer tracking for marketing analysis: Low level feature extraction”, *Human Activity Recognition and Modelling Workshop at the BMVC (HAREM)*, 2005.
- ✓ Alex Leykin and Mihran Tuceryan “Automatic determination of text readability over textured backgrounds for augmented reality systems”, *International Symposium on Mixed and Augmented Reality (ISMAR)*, 2004.

Technical Reports

- ✓ Alex Leykin and Mihran Tuceryan “Tracking and activity analysis in retail environments”, *Indiana University Technical Report 620*, 2005.
- ✓ Alex Leykin and Mihran Tuceryan “Customer tracking for marketing analysis”, *Indiana University Technical Report 612*, 2005.
- ✓ Danko Antolovic, Alex Leykin, and Steven Johnson “Vanishing point: a visual road-detection program for a DARPA grand challenge vehicle”, *Indiana University Technical Report*, 2005.
- ✓ Alex Leykin, Florin Cutzu, and Hammoud Riad “Visual properties differentiating art from real scenes”, *Indiana University Technical Report 565*, 2002.

References

Mihran Tuceryan (advisor)
Dept of Comp & Info Science,
Indiana University-Purdue University, Indianapolis
723 W. Michigan St, SL 280K
Indianapolis, IN 46202-5132
Phone: (317) 274-9736
Fax: (317) 274-9742
email: tuceryan@cs.iupui.edu
web: <http://www.cs.iupui.edu/~tuceryan>

Andrew J. Hanson
Professor and Chair
Computer Science Dept.
Indiana University
Lindley Hall 215
150 S. Woodlawn Ave.
Bloomington IN 47405-7104
phone: 812-855-4510
fax: 812-855-4829
email: hanson@cs.indiana.edu
web: <http://www.cs.indiana.edu/~hanson>

Steven D. Johnson
Indiana Univ. Computer Science Dept.
Lindley Hall
150 S. Woodlawn Ave.
Bloomington IN 47405-7104
tel: 812-855-2567
fax: 812-855-4829
email: sjohnson@cs.indiana.edu
web: <http://www.cs.indiana.edu/~sjohnson>

Raymond R. Burke
E.W. Kelley Professor of Business Administration
Indiana University
Kelley School of Business
1309 East 10th Street
Bloomington, IN 47405-1701
phone: 812-855-1066
fax: 812-855-6440
email: rayburke@indiana.edu