Alireza Ghasemi

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Research Interests

Computer Vision and Image Processing: Image Retrieval, Image-Based Localization, Multi-Camera Imaging, Multi-View Reconstruction, Feature Tracking, Video Analysis, Computational Photography, Augmented Reality.

Machine Learning and Pattern Recognition: Semi-Supervised and Active Learning, One-Class Learning, Multi-view Learning, Human Computation.

Information Retrieval, Data Mining and Big Data: Text Classification, Rank and Metric Learning, Sentiment Analysis.

Education

École Polytechnique Fédérale de Lausanne **Lausanne, Switzerland**
PhD, Computer, Communication and Information Sciences *2011–Present*
Granted doctoral fellowship by the school of computer and communication sciences. Supervised by Professor Martin Vetterli and Dr. Adam James Scholefield.

Sharif Univeristy of Technology **Tehran, Iran**
M.Sc., Artificial Intelligence *2009–2011*
Ranked 1^{st} by GPA ($\frac{19.52}{20}$) among the class of 2011. Supervised by Professor M.T. Manzuri

Sharif Univeristy of Technology **Tehran, Iran**
B.Sc., Software Engineering *2005–2009*

Experience

École Polytechnique Fédérale de Lausanne **Lausanne, Switzerland**
Doctoral Researcher *2011–Present*

In charge for cutting-edge research in the areas of computational photography, multi-camera systems and image-based indoor localization. I develop mainly in MATLAB and Java with JavaScript for visualization and Python for scripting.

- Developed a patent regarding inventions in the area of light-field image retrieval.
- Proposed the first publicly-available dataset for light-field object recognition.
- Participated as an R&D engineer in the development of an outdoor urban localization system exploiting light-field information.

DSP Lab - Sharif University of Technology **Tehran, Iran**
Research Assistant *2010–2011*
In charge for development of innovative approaches for exploiting user feedback to improve the underlying machine learning model in an image retrieval system. I used MATLAB and Java to develop the system.

- Developed a novel robust one-class classification framework and added active and semi-supervised learning capability to the well-known Support Vector Data Description (SVDD) model.

Intelligent Information Systems (IIS) Laboratory **Tehran, Iran**
Web Portal Developer *2009–2010*
Database and front-end developer (PHP/Java) for a national-level enterprise project management system.

Peykasa Messageware Group **Tehran, Iran**
Backend Service Developer *May 2009– October 2009*
Developer of the Java backend in an integrated messaging platform incorporating e-mail and SMS services. Development was done in JavaEE, GWT and AJAX.

Mabna Software **Tehran, Iran**
Software Engineering Intern *June 2008– September 2008*
Participated in the development of the training dataset and implementation of novel algorithms for a statistical machine translation system for the Persian language (Pars Translator). I used Java and C# for development.

Teaching Experiences

École Polytechnique Fédérale de Lausanne **Lausanne, Switzerland**
Teaching Assistant *Fall 2012 – Fall 2014*
Teaching assistant in various graduate and undergraduate courses including Statistical Signal Processing, Mathematical Signal Processing and Digital Signal Processing (online course offered on the Coursera platform).

Sharif University of Technology **Tehran, Iran**
Teaching Assistant *Fall 2006 – Spring 2011*
Teaching assistant in various graduate and undergraduate courses including Introductory Programming, Database Design and Statistical Pattern Recognition.

Payam-e-Noor University of Qeshm **Qeshm, Iran**
Lecturer *Fall 2009*
Lecturer of Introductory and Advanced Programming courses.

Publications

Patents

- **Alireza Ghasemi**, Laurent Rime, Martin Vetterli, *Distinguishing real scenes from printed photos using a light-field camera*. US-61898739, Provisional Patent Filed November 2013.
- **Alireza Ghasemi**, Laurent Rime, Martin Vetterli: *Method and Apparatus for Identifying Local Features*. Swiss Patent No. 2013CH-1102, Filed June 2013.

Papers

- **Alireza Ghasemi** and Martin Vetterli: *Detecting Planar Surface Using a Light-Field Camera with Application to Distinguishing Real Scenes From Printed Photos*. ICASSP 2014, Florence ,Italy.
- **Alireza Ghasemi**, Mahdad Hosseini Kamal and Martin Vetterli: *Computationally Efficient Background Subtraction in the Light Field Domain*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- **Alireza Ghasemi**, Nelly Afonso and Martin Vetterli: *LCAV-31: A Dataset for Light Field Object Recognition*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- **Alireza Ghasemi** and Martin Vetterli,: *Scale-Invariant Representation of Light Field Images for Object Recognition and Tracking*. IS&T/SPIE Electronic Imaging 2014, San Francisco. California, USA, February 2-6, 2014.
- Claudiu Cristian Musat, **Alireza Ghasemi**, Boi Faltings:*Sentiment Analysis Using a Novel Human Computation Game*. ACL 2012 People's Web Meets NLP Workshop, 2012.
- **Alireza Ghasemi**, Hamid R. Rabiee, Mohammad T. Manzuri, Mohammad H. Rohban: *A Bayesian Approach to the Data Description Problem*. AAAI Twenty-Sixth Conference on Artificial Intelligence (AAAI-12), 2012
- Amirhossein Tavanaei, **Alireza Ghasemi**, Mohammad Tavanaei, Hossein Sameti, Mohammad T. Manzuri:*Support Vector Data Description for Spoken Digit Recognition*. International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS 2012), 2012:32-37.
- **Alireza Ghasemi**, Hamid R. Rabiee, Mohsen Fadaee, Mohammad T. Manzuri, Mohammad H. Rohban: *Active Learning from Positive and Unlabeled Data*. IEEE ICDM 2011 Workshop on Optimization Based Methods for Emerging Data Mining Problems (OEDM'11), 2011:244-250.
- **Alireza Ghasemi**, Mohammad T. Manzuri, Hamid R. Rabiee, Mohammad H. Rohban, Siavash Haghiri:*Active One-Class Learning by Kernel Density Estimation*. IEEE International Workshop on Machine Learning for Signal Processing (MLSP'11), 2011:1-6.

Theses

- *Content-Based Image Retrieval Using Relevance Feedback and Semi-Supervised Learning*, M. Sc. Thesis, Under Supervision of Dr. Mohammad Taghi Manzuri, Summer 2011.
- *A Survey on Website Classification Methods with Introduction to a New Method Based on Internal PageRanks*, B.Sc. Thesis, Under Supervision of Dr. Hassan Abolhassani, Summer 2009.

Selected Courses

Doctoral School: Foundations of Imaging Sciences(6.0), Convex Optimization(5.5), Statistical Signal Processing(5.5)

Graduate School: Image Processing(19.2), Speech Processing(19), Machine Learning(19.2), Pattern Recognition(19.5), Human and Computer Vision(20)

Undergraduate: Database Systems(18.5), Object-Oriented Design (18.8), System Analysis and Design(20), Software Engineering(19), Information Retrieval(20), Computer Networks(19.2) , Compiler

Design(20), Programming Languages (20)

Skills

Java Development: Expert. In-depth knowledge of JavaSE, JavaFX, Swing, JDBC, Weka, etc. Working knowledge in Android development

JavaScript: Experienced in Node.JS, Chrome extensions, frameworks, client-side scripting, etc.

C/C++: Experiences with OpenCV and STL.

Web Development: Experiences in Symfony, Spring, Struts2, GWT, Grails, etc.

MATLAB: Proficient in Signal and Image Processing, Computer Vision and Pattern Recognition toolboxes.

Python: Experiences in Blender scripting, NumPy and SciPy.

Typesetting: Fluent in LaTeX.

Database Design: Experiences in SQL, ERD, NoSQL (MongoDB, Firebase).

Languages

Persian: Native

English: Full professional proficiency — *Used extensively in study and work. C1 level.*

French: Limited working proficiency — *Learning since 2012. Currently in B1 level.*

German: Limited working proficiency — *Learning since 2013. Currently in A2 level.*

Arabic: Elementary proficiency — *Learned basics in high school.*

Selected Honors and Awards

Doctoral Fellowship from the I&C School of EPFL — **Lausanne, Switzerland**
Granted full one-year fellowship to start PhD. — *Fall 2011*

Ranked 1st in the Artificial Intelligence section of the Sharif University — **Tehran, Iran**
Ranked by GPA. — *Summer 2011*

Ranked 1st in the nationwide graduate entrance exam in IT engineering — **Tehran, Iran**
Among more than 13,000 students. — *Summer 2009*

Ranked 183rd (top %0.06) in the nationwide university entrance exam — **Tehran, Iran**
Among more than 300,000 students in the Mathematics branch. — *Summer 2005*

Ranked 33rd (top %0.006) in the nationwide university entrance exam — **Tehran, Iran**
Among more than 500,000 students in the Foreign Languages branch. — *Summer 2005*

Interests

Reading: Literature, History, Technology. Gaining general knowledge through reading about different topics of interest from historical analyses to technology reviews

References

Available upon request