



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 University of Technology

Tehran, Iran

M.Sc., Artificial Intelligence

2009–2011

Ranked 1st by GPA ($\frac{19.52}{20}$) among the class of 2011. Supervised by Professor M.T. Manzuri

Sharif University 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