Alireza Ghasemi

Avenue de l'Eglise-Anglaise 14 – 1006 Lausanne – Switzerland
+41 (78) 677 5131 • ☎ +41 (21) 693 1371
✉ alireza.ghasemi@epfl.ch • aghasemi.github.io • ghasemialireza
a_ghasemi • aghasemi

Research Interests

Computer Vision and Image Processing: Image Retrieval and Localization, Multi-Camera Reconstruction, 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 and Communication Sciences — *September 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 — *September 2009 – August 2011*
Ranked 1^{st} by GPA $(19.52/20)$ among the class of 2011. Supervised by Professor M.T. Manzuri.

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

Professional Experience

École Polytechnique Fédérale de Lausanne — **Lausanne, Switzerland**
Doctoral Researcher — *January 2012 – 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 two patents and a series of publications regarding inventions in the area of light-field image retrieval.
- Proposed the first publicly-available dataset for light-field object recognition.
- R&D engineer in a team of experts in an industrial project to develop an outdoor localization platform.

AI Lab - École Polytechnique Fédérale de Lausanne **Lausanne, Switzerland**
Doctoral Assistant *September 2011 – January 2012*
I was in charge for investigating novel solutions to incorporate the active learning framework into the recently proposed human computation paradigm. I developed a novel online game in Java (using the Play! framework and RESTful services) to exploit human computation paradigms in sentiment analysis.

DSP Lab - Sharif University of Technology **Tehran, Iran**
Research Assistant *March 2010 – August 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 Developer *October 2009 – March 2010*
Database and web developer (PHP/Java) for a national-level enterprise project management system.

Peykasa Messageware Group **Tehran, Iran**
Backend Service Developer *May 2009 – October 2009*
Backend developer in an integrated messaging platform. I developed in JavaEE, GWT and AJAX.

Semantic Web Research Lab - Sharif University of Technology **Tehran, Iran**
R&D Assistant *January 2009 – May 2009*
Developer of an intelligent system (in Java) to categorise websites exploiting their internal link structure.

Mabna Software **Tehran, Iran**
Software Engineering Intern *June 2008 – September 2008*
R&D engineer and analyst for the Pars statistical machine translation in Java and C#.

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.

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.

Publications

- *Alireza Ghasemi*, Adam Scholefield and Martin Vetterli: **On the Accuracy of Point Localisation in a Circular Camera-Array**. IEEE International Conference on Image Processing (ICIP), 2015.
- *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.
- Alireza Ghasemi, M. T. Manzuri (dir): **Content-Based Image Retrieval Using Relevance Feedback and Semi-Supervised Learning**, M. Sc. Thesis, Summer 2011.
- Alireza Ghasemi, Hassan Abolhassani (dir): **A Survey on Website Classification Methods with Introduction to a New Method Based on Internal PageRanks**, B.Sc. Thesis, Summer 2009.

Selected Honors and Awards

IEEE Signal Processing Society Travel Grant **Lausanne, Switzerland**
Granted the IEEE SPS Travel Grant to attend the conference ICIP 2015. *Spring 2015*

Qualcomm Innovation Fellowship 2015 — **Lausanne, Switzerland**
Winner of the prestigious Qualcomm Innovation Fellowship (QInF'15). — *Spring 2015*

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 1st in the national graduate entrance exam in computer engineering — **Tehran, Iran**
Among more than 17,000 students. Computer Architecture and AI sections. — *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*

Selected Courses

Doctoral School: Foundations of Imaging Sciences $(6.0/6)$, Convex Optimization $(5.5/6)$, Statistical Signal Processing $(5.5/6)$.

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

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

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++: Experiences with OpenCV and STL.

Web Development: Experiences in REST, Symfony, Spring MVC, Play!, GWT, Grails, etc.

Operating Systems: Linux (Debian, Mint, Ubuntu), Windows.

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

Python: Experiences in Blender scripting, NumPy and SciPy, IPython Notebooks.

Typesetting: Fluent in LaTeX.

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

Cloud Development: Google App Engine, Heroku, IaaS, Meteor.

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.*

Interests

Reading: Literature, History, Technology. Gaining general knowledge through studying novel topics.

References

Available upon request