



# 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 1<sup>st</sup> 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*

## Professional 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 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*

*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 Developer*

*2009–2010*

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.

## **Selected 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*, 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 Haghighi: **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 Honors and Awards

### Qualcomm Innovation Fellowship 2015

Winner of the prestigious Qualcomm Innovation Fellowship (QInF'15).

Lausanne, Switzerland

Spring 2015

<b>Doctoral Fellowship from the I&amp;C School of EPFL</b> <i>Granted full one-year fellowship to start PhD.</i>	<b>Lausanne, Switzerland</b> <i>Fall 2011</i>
<b>Ranked 1st in the Artificial Intelligence section of the Sharif University</b> <i>Ranked by GPA.</i>	<b>Tehran, Iran</b> <i>Summer 2011</i>
<b>Ranked 1st in the nationwide graduate entrance exam in IT engineering</b> <i>Among more than 13,000 students.</i>	<b>Tehran, Iran</b> <i>Summer 2009</i>
<b>Ranked 183rd (top %0.06) in the nationwide university entrance exam</b> <i>Among more than 300,000 students in the Mathematics branch.</i>	<b>Tehran, Iran</b> <i>Summer 2005</i>

## Selected Courses

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**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

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**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 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 L<sup>A</sup>T<sub>E</sub>X.

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

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

## Languages

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**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

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

## References

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Available upon request