Alireza Ghasemi

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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, 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 1st 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   *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.

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

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