Mohsen Ghafoorian

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Education

Oct 2013 - June 2017 **Ph.D. in Machine Learning for Medical Image Analysis**.
Radboud University, Computer Science Department, Nijmegen, the Netherlands.

2010–2012 **M.Sc. in Artificial Intelligence**.
Sharif University of Technology, Tehran, Iran.

2005–2010 **B.Sc. in Software Engineering**.
University of Tehran, ECE Department, Tehran, Iran.

2001–2005 **Diploma in Mathematics and Physics**.
Allameh Helli highschool, National Organization for Development of Exceptional Talents, Tehran, Iran.

Work Experience

July 2017 - present **Senior Machine Learning R&D Engineer**, *TomTom*.
Working as a deep learning expert on automated generation of HD maps for self-driving cars.

Nov. 2016 - Apr. 2017 **Visiting Researcher**, *Harvard Medical School*.
Applying deep neural networks for medical image computing.

Feb. 2010 - Sept. 2013 **Computer Group Manager and Lecturer**, *Allameh Helli 3 (National Organization for Exceptional Talents)*.
Teaching C++, data structures, algorithms,supervising AI projects and managing a team of 10 computer programming teachers.

Honors and Awards

2005 **Top 0.1% rank**.
448-th rank in the national bachelor program entrance exam, among nearly 500,000 participants.

2007 **2nd team rank**.
in University of Tehran qualification contest for Asia regional ACM Programming contest Tehran site.

2010 **Top 0.2% rank**.
27-th rank in the national Artificial Intelligence graduate program entrance exam, among nearly 20,000 participants

2016 **Annual travel grant of the Dutch MS Research Foundation**.
For a research visit to Harvard Medical School.

2017 **MICCAI Society Travel Award**.
MICCAI paper was selected for travel award.

Selected Publications

You can see my full publications list on my Google scholar page.

1. **M. Ghafoorian**, C. Nugteren, N. Baka, O. Booij, M. Hofmann, *EL-GAN: Embedding Loss Driven Generative Adversarial Networks for Lane Detection*, ECCV Computer Vision for Road Scene Understanding and Autonomous Driving Workshop 2018.
2. **M. Ghafoorian**, N. Karssemeijer, T. Heskes, M. Bergkamp, J. Wissink , J. Obels, K. Keizer, F.E. de Leeuw, B. van Ginneken, E. Marchiori and B. Platel, *Deep multi-scale location-aware 3D convolutional neural networks for automated detection of lacunes of presumed vascular origin*, NeuroImage Clin. 2017.
3. **M. Ghafoorian**, N. Karssemeijer, T. Heskes, I. van Uden, F.E. de Leeuw, B. van Ginneken and B. Platel, *Non-uniform patch sampling with deep convolutional neural networks for white matter hyperintensity segmentation*, IEEE International Symposium on Biomedical Imaging (ISBI) 2016.
4. **M. Ghafoorian**, N. Karssemeijer, T. Heskes, I. van Uden, C. Sanchez, G. Litjens, F.E. de Leeuw, B. van

Ginneken, E. Marchiori and B. Platel, *Location-sensitive deep convolutional neural networks for segmentation of white matter hyperintensities*, Nature Scientific Reports 2017.

5. **M. Ghafoorian***, A. Mehrtash*, T. Kapur, N. Karssemeijer, E. Marchiori, M. Pesteie, C. Guttmann, F-E de Leeuw, C. Tempany, B. van Ginneken, A. Fedorov, P, Abolmaesumi, B. Platel, W. Wells III, *Transfer Learning for Domain Adaptation in MRI: Application in Brain Lesion Segmentation*, MICCAI 2017.
6. **M. Ghafoorian***, J. Teuwen*, R. Manniesing, F.E. de Leeuw, B. van Ginneken, N. Karssemeijer and B. Platel, *Student Beats the Teacher: Deep Neural Networks for Lateral Ventricles Segmentation in Brain MR*, SPIE Medical Imaging 2018.
7. **M. Ghafoorian**, N. Karssemeijer, I. van Uden, F.E. de Leeuw, T. Heskes, E. Marchiori and B. Platel, *Automated detection of white matter hyperintensities of all sizes in cerebral small vessel disease*, Medical Physics 2016.
8. **M. Ghafoorian**, N. Taghizadeh and H. Beigy, *Automatic abstraction in reinforcement learning using ant system algorithm*, AAAI Spring Symposium: Lifelong Machine Learning 2013.
9. **M. Ghafoorian**, N. Karssemeijer, T. Heskes, I. van Uden, F.E. de Leeuw, E. Marchiori and B. Platel, *Small white matter lesion detection in cerebral small vessel disease*, SPIE Medical Imaging 2015.
10. A. Mehrtash, **Ghafoorian**, G. Pernelle, A. Ziaei, F.G. Heslinga, K. Tuncali, A. Fedorov, R. Kikinis, C.M. Tempany, W.M. Wells, P. Abolmaesumi, *Automatic Needle Segmentation and Localization in MRI with 3D Convolutional Neural Networks: Application to MRI-targeted Prostate Biopsy*, IEEE transactions on medical imaging 2018.
11. H. Meine, G. Chlebus, **M. Ghafoorian**, I. Endo, A. Schenk, *Comparison of U-net-based Convolutional Neural Networks for Liver Segmentation in CT*, arXiv:1810.04017 2018.
12. A. Mehrtash, A. Sedghi, **M. Ghafoorian**, M. Taghipour, C. Tempany, W. Wells III, T. Kapur, P. Mousavi, P. Abolmaesumib, and A. Fedorov, *Classification of Clinical Significance of MRI Prostate Findings Using 3D Convolutional Neural Networks*, SPIE Medical Imaging 2017.
13. K. Vijverberg, **M. Ghafoorian**, I. van Uden, F.E. de Leeuw, B. Platel and T. Heskes, *A single-layer network unsupervised feature learning method for white matter hyperintensity segmentation*, SPIE Medical Imaging 2016.
14. T. van den Heuvel, **M. Ghafoorian**, A. van der Eerden, B. Goraj, T. Andriessen, B. ter Haar Romeny and B. Platel, *Computer aided detection of brain micro-bleeds in traumatic brain injury*, SPIE Medical Imaging 2015.
15. G. Litjens, T. Kooi, B. Ehteshami, A. Setio, F, Ciompi, **M. Ghafoorian**, J. van der Laak, B. van Ginneken, and C. SÃąnchez, *A Survey on Deep Learning in Medical Image Analysis*, Medical Image Analysis 2017.
16. I. van Uden, E. van Leijsen, **M. Ghafoorian**, M. Bergkamp, V. Lohner, E. Kooijmans, H. van der Holst, A. Tuladhar, D. Norris, E. van Dijk, L. Rutten-Jacobs, B. Platel, C. Klijn and F.E. de Leeuw, *Nonlinear temporal dynamics of cerebral small vessel disease The RUN DMC study*, Neurology 2017.

Invited Talks

Dec. 2018 **Nijmegen Deep Learning Meet-up**, Nijmegen, The Netherlands.
AI for map-making: Embedding Loss Generative Adversarial Networks for Lane Detection

Jan. 2017 **24th NA-MIC Project Week**, CSAIL MIT, Boston, MA.
Deep Learning: Under the Hood (Received top-ranking rating 4.3/5)

Oct. 2015 **Workshop on Automated Analysis of NeuroImaging Data**, Utrecht, The Netherlands.
White matter hyperintensity segmentation using location-sensitive convolutional neural networks

Teaching Experience

2016 **Lecturer**, *Deep Learning Workshop*, Radboud University.

2016 **Lecturer**, *M.Sc. course: Intelligent systems in Medical Imaging*, Radboud University.
rated with a median of 9/10 by the students.

2013 **Lecturer**, *B.Sc. course: Artificial Intelligence*, Azad University.

2013 **Lecturer**, *B.Sc. course: Introduction to Programming in C*, Azad University.

2015, 2016 **Teaching Assistant**, *M.Sc. course: Machine Learning in Practice*, Radboud University.

2014, 2015 **Teaching Assistant**, *M.Sc. course: Computer-Aided Diagnosis*, Radboud University.

2014 **Teaching Assistant**, *M.Sc. course: Bio-inspired Computing*, Radboud University.
2011 **Teaching Assistant**, *M.Sc. course: Machine Learning*, Sharif University of Technology.
2012 **Teaching Assistant**, *B.Sc. course: Artificial Intelligence*, Sharif University of Technology.
2012 **Teaching Assistant**, *B.Sc. course: Intro. to Programming*, Sharif University of Technology.
2006, 2007 **Teaching Assistant**, *B.Sc. course: Data Structures and Algorithms*, University of Tehran.
2006, 2007 **Teaching Assistant**, *B.Sc. course: Introduction to Programming in C*, University of Tehran.

Scientific Peer Review

- International Joint Conference on Neural Networks (IJCNN) 2019.
- Neural Information Processing Systems (NIPS) 2018, rated among top 30% reviewers
- IEEE Transactions on Medical Imaging (TMI), including the Deep Learning Special Issue
- IEEE Transactions on Computational Biology and Bioinformatics
- Nature Scientific Reports
- NeuroImage Clinical
- Medical Physics
- SPIE Journal of Medical Imaging (JMI)
- IEEE International Symposium on Biomedical Imaging (ISBI) 2016
- Medical Image Computing and Computer Assisted Intervention (MICCAI) 2015

Skills

Computer Skills
Programming Languages: **Python, C, C++, Java, Matlab, C#**
Deep Learning Libraries: **Tensorflow, PyTorch, Theano, Lasagne, Pylearn2**
Machine Learning/Image Processing Libraries: **OpenCV, sklearn, skimage**
Medical Image Processing Tool: **Mevislab**

Analytical Skills
Data Structures, Design and Analysis of Algorithms
Object Oriented and Software Design Patterns

Language Skills
Persian (Native)
English (Fluent)
Dutch (Basic: A2)

References

Dr. Bram Platel *bram.platel@radboudumc.nl*
Prof. Elena Marchiori *elenam@cs.ru.nl*
Prof. Nico Karssemeijer *nico.karssemeijer@radboudumc.nl*
Prof. Tom Heskes *t.heskes@science.ru.nl*
Prof. Bram van Ginneken *bram.vanginneken@radboudumc.nl*
Prof. William Wells III *SW@bwh.harvard.edu*
Dr. Tina Kapur *tkapur@bwh.harvard.edu*