Razvan Valentin Marinescu

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Research Interests

Machine Learning, Medical Applications, Computer Vision, Bayesian Statistics, Inference

Current Employer

Feb 2019 - present | **Postdoctoral Associate at Massachusetts Institute of Technology**
Advisor: Pollina Golland
Research focus: brain image analysis, classifier interpretability, generative modelling

Education

2014 - 2018 | **4-Year PhD in Medical Imaging, University College London**
PhD project: "Disease Progression Modelling and Evaluation in Alzheimer's Disease and Posterior Cortical Atrophy"
Supervisors: Prof. Daniel Alexander, Dr. Sebastian Crutch, Dr. Neil Oxtoby
Research focus: bayesian latent-variable models, machine learning, neuroimaging, disease progression modelling.

2010 - 2014 | **4-Year MEng in Computer Science, Imperial College London**
First Class Honours (top 10% of class in final year)
Master thesis: "On a new metric to compare internal structures in biological networks"
Supervisor: Dr. Natasa Przulj
Research focus: graph analysis, applications to biological and economic networks

Past Employment

Jan 2016 - Apr 2018 | **Teaching Assistant in Computational Modelling, UCL**
Taught computational modelling, bayesian statistics and numerical optimisation to Master students. Marked the students' coursework.

Sep 2014 - Aug 2018 | **Student Residence Advisor, University College London**
Provided pastoral support to students and emergency support.

Oct 2012 - Dec 2013 | **Teaching Assistant in Programming, Imperial College London**
Taught Haskell, Java and C to undergraduate students. Weekly marking of students' coursework.

Mar - Sep 2013 | **Industrial Placement at J.P. Morgan Chase & Co, Emerging Markets**
Assisted the retirement of a legacy system that was processing end-of-day market risk.

Jul - Sep 2012 | **Summer Internship at Goldman Sachs, Equities Technology**
Built programmes that automatically re-factored the Java source-code of a trading system. Learned about financial instruments and live market data.

Awards

2017 | Runner up (jointly) for the Francois Erbsmann Prize at the IPMI conference.
2015-17 | Travel and registration fellowships for several conferences: IPMI, AAIC and Human Brain Project.
2013 | DAAD Scholarship for doing a German Language course in Aachen, Germany over the summer.
2011 | Prize for the best undergraduate project in Artificial Intelligence, Imperial College London
2010 | Sponsored visit to NATO Headquarters, Brussels, for achievements in international projects and contests.
2009 | Grand Prize at the International Space Settlement Design Competition offered by NASA Johnsons Space Center.
2008 | Diploma of Excellency awarded by the Government of Romania for "impressive problem-solving skills".
2007 | Bronze Medal ar the 6th International Computer Project Competition "Informatix".
Silver Medal at the *National Mathematics Olympiad* in Romania.

Other significant activities

2019-20	President of the MIT Postdoctoral Association
2016-17	Taught Robotics and Computer Graphics courses at the Oxford for Romania Summer School
2011-14	Year representative at Imperial College faculty meetings

First author publications

2019

Poster **Marinescu, R.V.**, Lorenzi, M., Blumberg, S., Young, A.L., Morell, P.P., Oxtoby, N.P., Eshaghi, A., Yong, K.X., Crutch, S.J. and Alexander, D.C., 2019. Disease Knowledge Transfer across Neurodegenerative Diseases. MICCAI, 2019.

Talk **Marinescu, R.V.**, Alexander, D.C. and Golland, P., 2019. BrainPainter: A software for the visualisation of brain structures, biomarkers and associated pathological processes, MICCAI MBIA Workshop, 2019

Talk **Marinescu, R.V.**, Oxtoby, N.P., Young, A.L., Bron, E.E., Toga, A.W., Weiner, M.W., Barkhof, F., Fox, N.C., Golland, P., Klein, S. and Alexander, D.C., 2019, October. TADPOLE challenge: Accurate alzheimers disease prediction through crowdsourced forecasting of future data. In MICCAI Workshop on PRedictive Intelligence In MEdicine.

Journal **Marinescu, R.V.**, Eshaghi, A., Lorenzi, M., Young, A.L., Oxtoby, N.P., Garbarino, S., Crutch, S.J., Alexander, D.C. and Alzheimer's Disease Neuroimaging Initiative, 2019. DIVE: A spatiotemporal progression model of brain pathology in neurodegenerative disorders. NeuroImage, 192, pp.166-177.

Journal (*joint first-authors) *Firth, N.C., *Primativo, S., ***Marinescu, R.V.**, Shakespeare, T.J., Suarez-Gonzalez, A., Lehmann, M., Carton, A., Ocal, D., Pavisic, I., Paterson, R.W. and Slattery, C.F., 2019. Longitudinal neuroanatomical and cognitive progression of posterior cortical atrophy. Brain.

2018

Journal **Marinescu, R.V.**, Oxtoby, N.P., Young, A.L., Bron, E.E., Toga, A.W., Weiner, M.W., Barkhof, F., Fox, N.C., Klein, S. and Alexander, D.C., 2018. TADPOLE Challenge: Prediction of Longitudinal Evolution in Alzheimer's Disease. arXiv preprint arXiv:1805.03909.

2017

Talk **Marinescu, R.V.**, Eshaghi, A., Lorenzi, M., Young, A.L., Oxtoby, N.P., Garbarino, S., Shakespeare, T.J., Crutch, S.J., Alexander, D.C. and Alzheimers Disease Neuroimaging Initiative, 2017, June. A vertex clustering model for disease progression: application to cortical thickness images. In International Conference on Information Processing in Medical Imaging (pp. 134-145). Springer, Cham.

Poster **Marinescu, R.V.**, Primativo, S., Young, A.L., Oxtoby, N.P., Firth, N.C., Eshaghi, A., Garbarino, S., Cardoso, J.M., Yong, K., Fox, N.C. and Lehmann, M., 2017. Analysis Of The Heterogeneity Of Posterior Cortical Atrophy: Data-driven Model Predicts Distinct Atrophy Patterns For Three Different Cognitive Subgroups. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 13(7), pp.P106-P108.

2016

Poster **Marinescu, R.V.**, Young, A.L., Oxtoby, N.P., Firth, N.C., Lorenzi, M., Eshaghi, A., Wottschel, V., Cardoso, M.J., Modat, M., Yong, K. and Primativo, S., 2016. A Data-driven Comparison Of The Progression Of Brain Atrophy In Posterior Cortical Atrophy And Alzheimer's Disease. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 12(7), pp.P401-P402.

Joint publications

2019

Journal Eshaghi, A., **Marinescu, R.V.**, Young, A.L., Firth, N.C., Prados, F., Jorge Cardoso, M., Tur, C., De Angelis, F., Cawley, N., Brownlee, W.J. and De Stefano, N., 2018. Progression of regional grey matter atrophy in multiple sclerosis. Brain, 141(6), pp.1665-1677.

Poster Slator, P.J., Hutter, J., **Marinescu, R.V.**, Palombo, M., Young, A.L., Jackson, L.H., Ho, A., Chappell, L.C., Rutherford, M., Hajnal, J.V. and Alexander, D.C., 2019, June. InSpect: INtegrated SPECTral Component Estimation and Mapping for Multi-contrast Microstructural MRI. In International Conference on Information Processing in Medical Imaging (pp. 755-766). Springer, Cham.

Journal Garbarino, S., Lorenzi, M., Oxtoby, N.P., Vinke, E.J., **Marinescu, R.V.**, Eshaghi, A., Ikram, M.A., Niessen, W.J., Ciccarelli, O., Barkhof, F. and Schott, J.M., 2019. Differences in topological progression profile among neurodegenerative diseases from imaging data, eLife

2018

Journal Young, A.L., **Marinescu, R.V.**, Oxtoby, N.P., Bocchetta, M., Yong, K., Firth, N.C., Cash, D.M., Thomas, D.L., Dick, K.M., Cardoso, J. and van Swieten, J., 2018. Uncovering the heterogeneity and temporal complexity of neurodegenerative diseases with Subtype and Stage Inference. Nature communications, 9(1), p.4273.

Journal Wijeratne, P.A., Young, A.L., Oxtoby, N.P., **Marinescu, R.V.**, Firth, N.C., Johnson, E.B., Mohan, A., Sampaio, C., Scahill, R.I., Tabrizi, S.J. and Alexander, D.C., 2018. An imagebased model of brain volume biomarker changes in Huntington's disease. Annals of clinical and translational neurology, 5(5), pp.570-582.

Poster Young, A.L., Scelsi, M.A., **Marinescu, R.V.**, Schott, J.M., Ourselin, S., Alexander, D.C. and Altmann, A., 2018. Genomewide Association Study Of Data-driven Alzheimer's Disease Subtypes. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 14(7), pp.P1042-P1043.

Poster Garbarino, S., Lorenzi, M., Vinke, E., **Marinescu, R.V.**, Oxtoby, N.P., Eshaghi, A., Ikram, M.A., Niessen, W.J., Ciccarelli, O., Barkhof, F. and Vernooij, M.W., 2018. Mechanistic Profiles Of Neurodegeneration: A Study In Alzheimers Disease, Healthy Ageing And Primary Progressive Multiple Sclerosis. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 14(7), pp.P1280-P1281.

2017

Poster Young, A.L., **Marinescu, R.V.**, Yong, K., Firth, N.C., Oxtoby, N.P., Cash, D.M., Fox, N.C., Crutch, S.J., Rohrer, J.D., Schott, J.M. and Alexander, D.C., 2017. Characterising The Progression Of Alzheimers Disease Subtypes Using Subtype And Stage Inference (Sustain). Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 13(7), pp.P791-P792.

Poster Young, A.L., **Marinescu, R.V.**, Oxtoby, N.P., Bocchetta, M., Cash, D.M., Thomas, D.L., Dick, K.M., Cardoso, M.J., Ourselin, S., van Swieten, J.C. and Borroni, B., 2017. Multiple Distinct Atrophy Patterns Found In Genetic Frontotemporal Dementia Using Subtype And Stage Inference (Sustain). Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 13(7), pp.P453-P454.

Poster Primativo, S., **Marinescu, R.V.**, Firth, N.C., Yong, K., Shakespeare, T.J., Gonzalez, A.S., Carton, A.M., Lehmann, M., Slattery, C.F., Paterson, R.W. and Foulkes, A.J., 2017. Longitudinal Evaluation Of Neuropsychological And Neuroimaging Progression In Posterior Cortical Atrophy. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 13(7), pp.P1382-P1383.

Poster Oxtoby, N.P., Young, A.L., **Marinescu, R.V.** and Alexander, D.C., 2017. Data-driven Models Of Disease Progression And Applications To Alzheimers Disease: Event-based Model And Differential Equation Models Of Biomarker Changes In ADNI. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 13(7), pp.P1323-P1325.

2016

Poster Firth, N.C., Brotherhood, E., Primativo, S., Young, A.L., **Marinescu, R.V.**, Oxtoby, N.P., Crutch, S.J. and Alexander, D.C., 2016. Data-driven Disease Progression Modelling Using Neuropsychological Tests: Posterior Cortical Atrophy Vs Alzheimer's Disease. Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 12(7), pp.P963-P964.

2015

Poster Young, A.L., Oxtoby, N.P., Huang, J., **Marinescu, R.V.**, Daga, P., Cash, D.M., Fox, N.C., Ourselin, S., Schott, J.M., Alexander, D.C. and Alzheimers Disease Neuroimaging Initiative, 2015, June. Multiple orderings of events in disease progression. In International Conference on Information Processing in Medical Imaging (pp. 711-722). Springer, Cham.

Under review/In preparation

- **Marinescu, R.V.** et al, The Alzheimer's Disease Prediction Of Longitudinal Evolution (TADPOLE) Challenge: Results after 1 Year Follow-up, in preparation

Theses

- MEng thesis: On a new signature that quantifies topological structure in biological and economic networks. Supervisors: Natasa Przulj, Marek Sergot.
- PhD thesis: Modelling the Neuroanatomical Progression of Alzheimer's Disease and Posterior Cortical Atrophy. Supervisors: Daniel Alexander, Sebastian Crutch, Neil Oxtoby

Talks

- *BrainPainter: A software for the visualisation of brain structures, biomarkers and associated pathological processes*, MICCAI MBIA workshop, 2019
- *TADPOLE Challenge: Accurate Alzheimer's disease prediction through crowdsourced forecasting of future data*, MICCAI PRIME workshop, 2019
- *Modelling the Neuroanatomical Progression of Alzheimer's Disease and Posterior Cortical Atrophy*, Athinoula A. Martinos Center, Cambridge MA, 2019
- *A vertex clustering model for disease progression: application to cortical thickness images.* International Conference on Information Processing in Medical Imaging, 2017 (Erbsmann Prize Runner-up)

Review experience

- Information Processing in Medical Imaging (IPMI)
- Medical Image Computing and Computer Assisted Surgery (MICCAI)
- NeuroImage
- Alzheimer's and Dementia
- Conference on Health, Inference, and Learning (CHIL)

News Coverage

- https://www.alzforum.org/news/community-news/tadpole-challenge-seeks-best-predictors-alzheimers
- https://www.alzforum.org/news/community-news/tadpole-challenge-winners-forecast-ad-symptoms

Software

- BrainPainter: https://brainpainter.csail.mit.edu/

About me

- Nationality: dual Romanian-British
- Languages spoken: Romanian (native), English (fluent), German (intermediate)
- Programming languages: Python, Java, C++, Haskell, Matlab, Prolog, Assembly x86
- Technical Experience with: Git, Vim, LaTeX, OS programming, Compilers