Razvan Valentin Marinescu

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Research Interests

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

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

Employment

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

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 nstruments 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 Brussels, at the NATO Headquarters, for the achievements in international projects and Olympiads.
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 International Workshop on PRedictive Intelligence In MEdicine (pp. 1-10). Springer, Cham.

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
- Neural Information Processing Systems (NeurIPS)
- 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