Catalina V. Anghel

UC Davis Genome Center, GBSF
One Shields Ave, Davis, CA 95616-8816
catalina.anghel@alum.utoronto.ca
https://canghel.github.io/

Profile

Data scientist with experience and interest in applying machine learning methods (in particular deep learning) to improve health

Experience

Postdoctoral Fellow **2016 - 2017**
UC Davis Genome Center, Davis, CA
Supervisor: Dr. Gerald Quon

- Performed quality control, normalization and removal of confounding factors in single-cell RNA-Seq expression data and developed a Gamma-Poisson model for imputation of dropout events
- Used an autoencoder to perform unsupervised dimensionality reduction on single-cell gene expression profiles to distinguish cell types and developmental trajectories

Postdoctoral Fellow **2014 - 2015**
Ontario Institute for Cancer Research, Toronto, ON
Supervisor: Dr. Paul C. Boutros

- ISOpureR: Translated and optimized an algorithm based on a Bayesian statistical model for determining the fraction of cancer in a bulk tumor sample and the patient-specific and healthy profiles (from MATLAB to R)
- Collaborated in small groups on processing clinical and genomic (SNP) data and on developing machine-learning models for prediction of patient outcome in Sage Bionetworks DREAM Challenges on prostate cancer and Alzheimer's disease

Course Instructor and Teaching Assistant **2007 - 2013**
University of Toronto, Toronto, ON

- Taught in an active-learning style, developed activities such as problem-solving sessions, coordinated TAs, and prepared quizzes and tests as a sole and co-responsibility course instructor for calculus and linear algebra
- Led weekly tutorial sessions for courses ranging from vector calculus to number theory to classical geometries
- Daniel B. DeLury Teaching Award, 2012

Education

Ph.D. in Mathematics **2007 - 2013**
University of Toronto, Toronto, ON
Advisor: Prof. V. Kumar Murty

M.Sc. in Mathematics, ALGANT **2005 - 2007**
University of Bordeaux, France and University of Padova, Italy

B.Sc. Honours Applied Mathematics **2000 - 2005**
McGill University, Montreal, QC

Technical Skills

Machine Learning: Neural networks/deep learning; standard algorithms such as random forests, support vector machines, expectation maximization

Programming Languages: R (advanced), MATLAB and Torch (intermediate), Python and PyTorch (beginner)

Data processing: Genomic data (microarray and RNA-Seq expression profiles, SNP), imaging, time series

Publications

Anghel C., Archer K., Chang, J.M., Cochran A., Radulescu, A., Djima K., Turner R., Zhong L. *Explaining Autism Spectrum Disorder with Placenta* (in preparation)

Allen G.I., Amoroso N., **Anghel C.**, Balagurusamy V., *et al.* *Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease.* Alzheimer's and Dementia. (2016) 12(6) 645-53.

Anghel C., Quon G., Haider S., Nguyen F., Deshwar A.G., Morris Q.D., Boutros P.C. *ISOpureR: an R implementation of a computational purification algorithm of mixed tumour profiles.* BMC Bioinformatics. (2015) 16:156.

Anghel C.. *The self power map and collecting all residue classes.* Mathematics of Computation. (2016) 85:379-399

Alzalg B., **Anghel C.**, Gan W., Huang Q., Rahman M., Shum A., Wu C.W. *Contingency constrained optimal power flow solutions in complex network power grids.* ISCAS (2012) 1636-1639.

Anghel C., Margrave G., Nigam N. *Locating anomalous seismic attenuation: A mathematical investigation.* Canadian Applied Math Quarterly. (2004) 12(4): 439-476.

Service

Data and Software Carpentry Instructor

Taught basic lab skills for data-driven research and computing to students and researchers

- Data Carpentry Genomics, St. Louis, MO — June 17, 2017
- Data Carpentry Genomics, Stanford University, CA — January 22-23, 2017
- Software Carpentry, University of Ontario, Oshawa, ON — January 8-9, 2015

University of Toronto Mentor, Toronto ON — **2014 -present**

Provided career and academic guidance and encouragement to undergraduate students in mathematics, during bi-weekly meetings

GANITA Conference Organizer, Toronto, ON — **Spring 2016**