

# Fatemeh Vafaei

## Curriculum Vitae

School of Biotechnology and Biomolecular Sciences  
University of New South Wales, Sydney NSW 2006

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### Academic Positions

- 5/2017– Present **Senior Lecturer**, *School of Biotechnology and Biomolecular Sciences (BABS)*, University of New South Wales (UNSW Sydney), Australia.  
Research: Computational biomedicine, bioinformatics, systems biology
- 3/2013– 5/2017 **Research Fellow**, *School of Mathematics and Statistics & Charles Perkins Centre*, University of Sydney, Australia.  
Research: systems biology, integrative computational biomedicine, bioinformatics
- 8/2011– 9/2012 **Postdoctoral Associate**, *University Health Network, Ontario Cancer Institute, Department of Computer Science*, University of Toronto, Canada.  
Research: integrative computational biology, cancer informatics
- 8/2007– 5/2011 **Research Assistant**, *Artificial Intelligence Laboratory, Department of Computer Science*, University of Illinois at Chicago, USA.  
Research: artificial intelligence, optimization, machine learning, evolutionary algorithms

### Education

- 5/2011 **Ph.D.**, *Computer Science*, University of Illinois at Chicago, USA.  
Thesis Topic: Controlling Genetic Operator Rates in Evolutionary Algorithms
- 8/2006 **B.Sc.**, *Computer Engineering*, Sharif University of Technology, Tehran, Iran.  
Thesis Topic: Design and implementation of Multi-Media Value Added Service Provider

### Research Funding

- 2020 – 2022 Funding body: *National Health and Medical Research Council (NHMRC)*, Ideas, Title: Artificial intelligence-enhanced prediction of early indicators of metastasis in lung cancer using platelet genomics. Chief Investigators: **Vafaei F**, Hudson A, Jurisica I.  
**\$345K** (*requested*)
- 2019 – 2021 Funding body: *Cooperative Research Centres Project (CRC-P), Australian Government*, Title: Smart Sensor & Deep Learning Behavioural Engine for Personalised Health Monitoring. Lead Company: Nutromics Pty Ltd, AI Lead Investigator: **Vafaei F**.
- 2019 – 2021 Funding body: *Mark Hughes Foundation Brain Cancer Innovation Project Grant*, Title: Combining artificial intelligence and genomics to non-invasively monitor glioblastoma patients and predict tumour recurrence. Chief Investigators: **Vafaei F**, Howell V, Jurisica I.  
**\$150K**
- 2019 – 2020 Funding body: *Sydney Vital, Translational Cancer Research*, Title: Bioinformatician Funding Source USYD – UNSW. Chief Investigators: Howell V, **Vafaei F** (2020-2021)  
**\$64K**
- 2019 – 2021 Funding body: *Vertex Innovation Funds*, Title: Exosomal Biomarkers for Early Prediction of Cystic Fibrosis Related Diabetes. Chief Investigators: Waters S, Kicic A, Jaffe A, **Vafaei F**, Verge C, Widger J, Yvonne B et al. (2018)  
**€157K**

- 2019 – 2020 Funding body: *UNSW Scientia Education Investment Fund* , Title: Micro-credentials in bioinformatics/systems biology, genetics/genomics and protein structural biology. Chief Investigators: Whitaker N, **Vafaee F**, Oates E, Marquis C, Gaela A, *et al.*(2019-2020) **\$100K**
- 2019 – 2019 Funding body: *UNSW Research Technology Services*, Title: AI-empowered Brain Genomics (Machine learning and Cloud Computing Schemes) . Chief Investigator: **Vafaee F** **\$30K**
- 2019 – 2019 Funding body: *UNSW SFaculty Research Grants Program*, Title: Cell-identity mapping from massive single-cell data using deep learning. Chief Investigator: **Vafaee F** **\$9288**
- 2015 – 2016 Funding body: *SPARC Implementation Fund*, Title: The Sydney 1000 Cancer Project–Stage 1 Gastrointestinal Cancers Immunophenotyping Study. Chief Investigators: Charles K, Clarke S, Diakos C, Pavlakis N, Engel A, Gill A, Kneebone A, Hart D, Smith A, Byrne S, McGuire H, **Vafaee F**, King M. (2015) **\$175K**
- 2014 – 2015 Funding body: *Ramsay Research and Teaching Fund*, Title: Routine application of next generation sequencing for identifying Actionable Mutations in patients with non-small cell lung cancer. Chief Investigators: Pavlakis N, Howell V, Colvin E, **Vafaee F**. (2014) **\$60K**
- 2014 – 2015 Funding body: *Judith & David Coffey*, Title: Characterizing the temporal cellular response to a loss of redox homeostasis using systems biology approaches. Chief Investigators: **Vafaee F**, Fisher-Wellman K, Fazakerley D, Krycer J, James D, Kuncic Z. (2014) **\$17.6K**

## Publications

### Journal Papers (Corresponding or senior authorship is marked by \*)

- 2019 Ebrahimkhani S, Beadnall HN, Barnett MH, Suter CM, Buckland ME, **Vafaee F\***. Serum exosome microRNAs predict multiple sclerosis disease activity after fingolimod treatment, *Molecular Neurobiology*, *In press subject to minor revision*.
- 2019 Wong M, Braidy N, Pickford R, **Vafaee F**, Crawford J, Muenchhoff J, Schofield P, Attia J, Brodaty H, Sachdev P, Poljak A. Plasma lipidome variation during the second half of the human lifespan is associated with age and sex but minimally with BMI. *PLOS ONE*, vol 14, doi.org/10.1371/journal.pone.0214141
- 2018 Ebrahimkhani S, **Vafaee F**, Hallal S, Wei H, Lee M, Young P, Satgunaseelan L, Shivalingam B, Suter C, Buckland M, Kaufman K. Deep sequencing of circulating exosomal microRNA allows non-invasive glioblastoma diagnosis. *NPJ precision oncology, Nature*, 2(28, doi:10.1038/s41698-018-0071-0
- 2018 **Vafaee F**, Diakos C, Kirschner MB, Reid G, Michael MZ, Horvath LG, Alinejad-Rokny H, Cheng ZJ, Kuncic Z, Clarke S . A data-driven, knowledge-based approach to biomarker discovery: application to circulating microRNA markers of colorectal cancer prognosis. *NPJ systems biology and applications, Nature*, 4(1), 20, doi:10.1038/s41540-018-0056-1
- 2018 Chaudhuri R, Krycer JR, Fazakerley DJ, Fisher-Wellman KH, Su Z, Hoehn KL, Yang JYH, Kuncic Z, **Vafaee F\*** & James DE. The transcriptional response to oxidative stress is part of, but not sufficient for, insulin resistance in adipocytes *Scientific Reports*, 8, doi:10.1038/s41598-018-20104-x.
- 2018 Contaldi C, **Vafaee F\***, Nelson PC. Bayesian Network Hybrid Learning Using a Parent Reducing Site-specific Mutation Rate Genetic Algorithm. *Artificial Intelligence Review Journal* 1-28, doi:10.1007/s10462-018-9615-5.
- 2018 **Vafaee F\***, Dashti H, Alinejad-Rokney H. Transcriptomic Data Normalization. *Encyclopedia Of Bioinformatics and Computational Biology, Reference Module in Life Sciences*, Elsevier, doi: 10.1016/B978-0-12-809633-8.20209-4.
- 2017 **Vafaee F\***, Colvin EK, Mok SC, Birrer MJ, Howell VM, & Samimi G. Functional prediction of long non-coding RNAs in ovarian cancer-associated fibroblasts indicate a role in metastasis. *Scientific Reports* 4;7(1):10374. doi: 10.1038/s41598-017-10869-y.

- 2017 Ebrahimkhani S, **Vafaee F**, Young PE, Hur S, Hawke S, Devenney E, Beadnall H, Barnett MH, Suter C, & Buckland M. Exosomal microRNA signatures in multiple sclerosis reflect disease status. *Scientific Reports*, 7. doi:10.1038/s41598-017-14301-3
- 2016 **Vafaee F\***, Krycer J, Ma Xiuquan, Burykin T, James D, Kuncic Z. ORTI: an open-access repository of transcriptional interactions for interrogating mammalian gene expression data, *PLOS ONE*. 11(10), 1-21.
- 2016 **Vafaee F\***. Using Multi-objective Optimization to Identify Dynamical Network Biomarkers as Early-warning Signals of Complex Diseases, *Nature-Scientific Reports*, 24;6:22023. doi: 10.1038/srep22023.
- 2016 Parker N R, Hudson A L, Khong P, Parkinson J F, Ikin R, Zhu Y, Cheng Z J, **Vafaee F**, Chen J, Wheeler H R, Howell V.) Intratumoral heterogeneity of DNA repair pathways in glioblastoma, *Nature-Scientific Reports*, 4;6:22477. doi: 10.1038/srep22477.
- 2016 Domanova W, Krycer J, Chaudhuri R, Yang P, **Vafaee F**, Fazakerley D, Humphrey S, James D, Kuncic Z. (2016) Identifying kinase substrate relationships using temporal data from large-scale phosphoproteomics studies, *PLOS ONE*. 11(6), 1-14.
- 2015 Rollo J , Banihashemi N, **Vafaee F**, Crawford J, Kuncic Z, Holsinger D. Unravelling the mechanistic complexity of Alzheimer's disease with systems biology, *Alzheimer's & Dementia*, doi:10.1016/j.jalz.2015.10.010.
- 2014 Kotlyar M, Pastrello C, Pivetta, F, Lo Sardo A, Cumbaa, C, Li, H, Naranian, T, Niu Y, Ding Z, **Vafaee F**, Broackes-Carter F, Petschnigg, J, Mills, G.B, Jurisicova, A, Stagljar, I, Maestro, R, & Jurisica, I. In silico prediction of physical protein interactions and characterization of interactome orphans, *Nature Methods*, 12(1):79-84.
- 2013 **Vafaee F\***, Rosu D, Broackes-Carter F, and Jurisica I. Novel semantic similarity measure improves an integrative approach to predicting gene functional associations. *BMC Systems Biology*, 7:22.

#### Refereed Proceedings

- 2017 Contaldi C, **Vafaee F\***, Nelson PC. The Role of Crossover Operator in Bayesian Network Structure Learning Performance: a Comprehensive Comparative Study. *ACM, Genetic & Evolutionary Computation*, 769-776.
- 2014 **Vafaee F\***. Learning the structure of large-scale Bayesian networks using genetic algorithm, *ACM, Genetic and Evolutionary Computation*, 855-862.
- 2014 **Vafaee F**, Turan G, Nelson PC & Berger-Wolf TY. Balancing the exploration and exploitation in an adaptive diversity guided genetic algorithm, *IEEE, Evolutionary Computation*, 2570-2577.
- 2014 **Vafaee F**, Turan G, & Nelson PC. Among-site rate variation: adaptation of genetic algorithm mutation rates at each site, *ACM, Genetic & Evolutionary Computation*, 863-870.
- 2010 **Vafaee F**, Turan G, & Nelson PC. Optimizing Operator Rates Using a Markov Chain Model of Genetic Algorithms, *ACM, Genetic & Evolutionary Computation*, 721-728.
- 2010 **Vafaee F** & Nelson PC. An explorative and exploitative mutation scheme, *IEEE, Evolutionary Computation*, 1-8.
- 2009 Xu B, **Vafaee F** & Wolfson O. In-network query processing in mobile p2p databases, *ACM, Advances in Geographic Information Systems*, 207-216.
- 2009 **Vafaee F** & Nelson PC. A genetic algorithm that incorporates an adaptive mutation based on an evolutionary model, *IEEE, Machine Learning and Applications*, 101-107.
- 2008 **Vafaee F**, Xiao W, Nelson PC, & Zhou C. Adaptively evolving probabilities of genetic operators, *IEEE, Machine Learning and Applications*, 292-299.

#### Papers under-review/in-prep

- 2019 **Vafaee F\*** and AKM Azad, Deep Learning meets single-cell omics to personalise medicine. *Briefings in Bioinformatics*

- 2019 Azad AKM and **Vafaee F\***, Single cell data explosion: Deep learning in rescue. <http://arxiv.org/abs/1901.06105>.
- 2019 Bayati M, Rabiee H, Mehrbod M, **Vafaee F**, Ebrahimi D, Forrest A, Alinejad-Rokny H. CancersIGN: a user-friendly and robust tool for identification and classification of mutational signatures and patterns in cancer genomes. *bioRxiv*, doi: <https://doi.org/10.1101/424960>, *Scientific Reports*
- 2019 Colvin EK, Howell VM, & Samimi G, **Vafaee F\***, Prognostic utility of lncRNAs in ovarian cancer-associated fibroblasts. *Cancers*.
- 2019 Su ZT, KrycerJR, Yang, P, FazakerleyDJ, Fisher-Wellman K, **Vafaee F**, James DE, Global redox proteome and phosphoproteome analysis reveals widespread crosstalk and signal dysregulation induced by oxidative stress. *Nature Communications*.
- 2019 Forrest Koch, **Vafaee F\***, Effect of dimensionality reduction on clustering single cell RNA sequencing and cell type identification, *in-prep*
- 2019 AKM Azad, Mojdeh Dinarvand, Joshu Swift, Nematollahi A, Lutze-Mann L, **Vafaee F\***, Drug similarity network: a comprehensive online resource for repositioning of approved drugs, *in-prep*.
- [Abstracts peer-reviewed](#)
- 2019 Koch F and **Vafaee F\***, , *ISMB/ECCB 2019, Intelligent Systems for Molecular Biology*, July 2019, Switzerland.
- 2019 Bataresh A, **Vafaee F et al.**, Plasma microvesicles lipidomics of Cerebral malaria in mice model, *World inflammation Conference*, September 2019, Sydney Australia.
- 2017 Ebrahimkhani S, Barnett Michael, **Vafaee F**, Suter C, & Buckland M. An optimized protocol used to extract and profile EV small RNA from limiting amounts of human and mouse serum, *ISEV workshop on Diet, Environment and Extracellular Vesicles*, January 2017, Melbourne, Australia.
- 2016 Ebrahimkhani S, **Vafaee F**, Barnett Michael, Cropley J, Jayasooriah N, Suter C, & Buckland M. Small Non-coding RNAs from Serum Derived Extracellular Vesicles are Potential Biomarkers in Multiple Sclerosis, *ASMR NSW Annual Scientific Meeting*, May 2016, Sydney, Australia.
- 2015 **Vafaee F**, Colvin EK, Mok SC, Birrer MJ, Howell VM, & Samimi G. Analysis of long non-coding RNAs expression profiles in ovarian cancer-associated fibroblasts, *Intl. Conference on Health Informatics and Technology*, July 2015, Valencia, Spain.
- 2015 Parker NR, Hudson AL, Khong P, Parkinson JF, Ikin R, Chen ZJ, **Vafaee F**, Helen R. & Wheeler HR, Howell VM. Intratumoral heterogeneity of DNA repair pathways in glioblastoma, *Advances in Brain Cancer Research, American Association for Cancer Research Annual Meeting*, May 2015, Washington D.C., USA.
- 2015 Colvin EK, **Vafaee F**, Mok SC, Birrer MJ, Howell VM, & Samimi G. Differential expression of long non-coding RNAs in ovarian cancer-associated fibroblasts versus normal ovarian fibroblasts, *Advances in Ovarian Cancer Research, American Association for Cancer Research Annual Meeting*, April 2015, Philadelphia, USA.
- 2015 **Vafaee F**, Krycer J, James D, & Kuncic Z. Unravelling dynamic transcriptional responses to oxidative stress, *Intl. Conf. on Systems Biology (ICSB 15)*, Nov. 2015 Singapore.
- 2015 Cheng ZJ, Krycer J, Su T, Fazakerley D, Kuncic Z, & **Vafaee F**. Elucidating the cellular response to oxidative stress by a holistic and integrative multi-omics analysis, *Intl. Conf. on Systems Biology(ICSB 15)*, Nov. 2015 Singapore.
- 2014 **Vafaee F**, Holsinger D, & Conrad M. Temporal dynamics of oxidative stress-related gene transcription in the human prefrontal cortex during neurodegeneration, *Society of Free Radical Research International (17th SFRRI)*, March 2014 Kyoto, Japan.

- 2014 **Vafaee F** & Holsinger D Modelling the transcription of oxidative stress and neurodegeneration related genes in the mouse hippocampus during aging. *Intl. Conf. on Systems Biology (ICSB 14)*, Sep. 2014 Melbourne, Australia.
- 2014 Wong M, Norris D, Burchfield J, Krycer J, **Vafaee F**, Domanova W, Kuncic Z, & James D. (2014) Dynamic systems model of insulin signalling pathway for identifying causes of insulin resistance, *Intl. Conf. on Systems Biology (ICSB 14)*, Sep. 2014 Melbourne, Australia.
- 2014 Domanova W, Wong M, Parker B, Burchfield J, **Vafaee F**, Kuncic Z, & James D. Dynamic *in silico* reconstruction of the insulin signalling network, *Intl. Conf. on Systems Biology (ICSB 14)*, Sep. 2014 Melbourne, Australia.
- 2014 Domanova W, Krycer J, **Vafaee F**, James D, & Kuncic Z. Modelling the insulin signalling network: unravelling the molecular mechanisms of insulin resistance, *Intl. Conf. on Bioinformatics (InCoB2014)*, Aug. 2014 Sydney, Australia.
- 2013 Wong M, Domanova W, **Vafaee F**, Krycer J, Burchfield J, James D, & Kuncic Z. Network reconstruction and simulation of insulin resistance in adipocytes, *Computational Models for Life Science*, (CMLS 13), Nov. 2013 Sydney, Australia.

## Awards & Scholarships

- 2019 UNSW Science Visiting Research Fellowship
- 2010 CRA-W Grad Cohort Workshop scholarship, Computing Research Association-Women
- 2009 Grace Hopper Celebration of Women in Computing scholarship, Anita Borg Inst

## Editorial Responsibilities

- 2018 – Associate Editor of Journal of PLOS ONE
- 2017 – Associate Editor of Journal of Artificial Intelligence Review
- 2013 – Ad-hoc reviewer of journals of *Bioinformatics*, *Evolution*, *Medicine & Public Health*, *Artificial Intelligence Review*, *PLOS ONE*, and *Scientific Reports*.

## Leadership and Administration

### Executive Leadership

- 2019 – 2023 Member of **National Computational Merit Allocation Committee**, NCMAC
- 2018 – 2021 Member of UNSW **Women in Research Network** Executive Committee, WiRN
- 2018 – 2021 Member of School's **Executive Committee** (UNSW Sydney - School of BABS)
- 2018 – 2021 **Bioinformatics Coordinator** (UNSW Sydney - School of BABS)
- 2014 – 2017 Member of **Ramaciotti Facility Informatics** Advisory Committee, University of Sydney

### Conference Organisation

- 2019 Lead Organiser of **AI in Biomedicine** Symposium (UNSW - Sydney)
- 2018 Lead Organiser of **UNSW Bioinformatics Connect** (UNSW - Sydney)
- 2019 Program Committee Member of 30th **Intl. Conf. on Genome Informatics**, GIW
- 2019 Program Committee Member of the **Australian Bioinformatics And Computational Biology Society**, ABACBS
- 2019 Lead Organiser of **WiRN Share & Connect: Preparing for Mid-career**, UNSW
- 2019 Lead Organiser of **WiRN Share & Connect: International Engagement for Women in Academia**, UNSW
- 2015 Member of Local Organising Committee of **AMSI BioInfoSummer**, sponsored by Australian Mathematical Science Institute
- 2014 Organiser of **Visiting Scholar Seminar** for Prof Tanya Berger-Wolf from University of Illinois at Chicago, University of Sydney

2013 Organiser of **Visiting Scholar Seminar** for Prof Tilman Grune from German Institute of Human Nutrition, University of Sydney

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## Supervision and Mentorship

- 8/2018– **Postdoctoral Research Associate**, *AKM Azad*, School of BABS, UNSW Sydney.  
Present Research: Bioinformatics, Deep learning
- 7/2019– **Postdoctoral Research Assistant**, *Miad Zandavi*, School of BABS, UNSW Sydney.  
Present Research: Biomarker discovery, machine learning
- 8/2018– **Postdoctoral Research Assistant**, *Mojdeh Dinarvand*, School of BABS, UNSW Sydney.  
Present Research: Drug discovery
- 11/2018– **Research Assistant**, *Forrest Koch*, School of BABS, UNSW Sydney.  
Present Research: Cell-identity mapping from massive single-cell data using deep learning
- 9/2019– **Research Assistant**, *Mohamed Al-Mouiee*, School of BABS, UNSW Sydney.  
Present Research: Machine learning on Cloud (Google Cloud Platform)
- 9/2019– **Honours Student**, *Afia Tanzim*, School of BABS, UNSW Sydney.  
9/2020 Research: Biomarker discovery, systems biology
- 8/2018– **Research Assistant**, *Cameron Stewart*, School of BABS, UNSW Sydney.  
3/2019 Research: Deep learning, autoML, machine learning
- 11/2018– **SVRP Student**, *Rohan Dugdale*, School of BABS, UNSW Sydney.  
2/2019 Research: Deep learning for multi-omics integration
- 8/2015– **PhD Student**, *Saideh Ebrahimkhani*, Brain & Mind Research Inst, University of Sydney.  
12/2018 Research: Identification of exosomal microRNA Biomarkers in the progression of Multiple Sclerosis

## Past

- 1/2016– **MSc Student**, *Carlo Contaldi*, Dept. of Computer Science, University of Illinois at Chicago.  
6/2017 Research: Bayesian network hybrid learning using a parent reducing site-specific mutation rate genetic algorithm
- 2/2016– **Talented Student Project**, *James Gatenby*, Biochemistry, University of Sydney.  
7/2016 Research: Genomic analysis of the link between cancer and thrombosis
- 11/2013– **PhD Thesis**, *Westa Domanova*, School of Physics, University of Sydney.  
7/2016 Research: Modelling molecular mechanisms of insulin resistance.
- 10/2014– **Vacation Project**, *Jason Cheng*, Master of Medical Physics, University of Sydney.  
12/2014 Research: Integrative multi-omics analysis of cellular response to oxidative stress.
- 5/2014– **M.Phil Project**, *Joseph Chan*, Sydney Medical School, University of Sydney.  
2/2015 Research: Identifying common inflammatory gene signatures in cancers.
- 6/2014– **Postgraduate Project**, *Jason Cheng*, Master of Medical Physics, University of Sydney.  
9/2014 Research: Biomarker identification and survival analysis in colorectal cancer.
- 5/2011– **MSc Thesis**, *Nirari Barm*, Dep. of Computer Science, University of Illinois at Chicago.  
1/2012 Research: Effects of parameter settings on the performance of multiple population genetic algorithms with different topologies.

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## Teaching

- Terms 1-3, 2019 **BABS3301**, *Biomolecular Science Laboratory Project - Advanced*, School of BABS, UNSW.  
Role: Course coordinator
- Term 2, 2019 **BINF3010/9010**, *Applied Bioinformatics*, School of Computer Science, UNSW.  
Role: Lecturer, non-coding RNAs
- Term 2, 2019 **BABS3291**, *Genes, Genomes and Evolution*, School of BABS, UNSW.  
Role: Lecturer, Network Genomics module

- Term 2, 2019 **BIOC3111**, *Molecular Biology of Proteins*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module
- Term 1, 2019 **BABS3151**, *Human Genetics*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module
- Term 2, 2019 **BIOC3111**, *Molecular Biology of Proteins*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module
- Sem 2, 2018 **BABS3291**, *Genes, Genomes and Evolution*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module, R and data analysis lab
- Sem 1, 2018 **BABS3151**, *Human Genetics*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module
- Sem 1, 2018 **BIOC3111**, *Molecular Biology of Proteins*, School of BABS, UNSW.  
Role: Lecturer, Systems Biology module

## Professional Collaborators & Partnerships

### Industrial Partners

- Nutromics Pty. Ltd, Australia: <http://www.nutromics.com.au>
- BCAL diagnostics, Australia: <https://www.bcaldiagnosics.com>
- Chironix, Australia: <https://chironix.com>

### Institutional & Hospital Partners

- Garvan Institute for Medical Research, Sydney, Australia
- Centre for Healthy Brain Ageing, University of New South Wales, Sydney, Australia
- School of Biotechnology & Biomolecular Sciences, University of New South Wales, Sydney, Australia
- Centenary Institute, University of Sydney, Sydney, Australia
- University of Adelaide, Royal Adelaide Hospital, Australia
- Brain & Mind Research Institute, University of Sydney, Sydney, Australia
- Victor Chang Cardiac Research Institute, Sydney, Australia
- Kolling Institute of Medical Research, Royal North Shore Hospital, Sydney, Australia
- School of Information Technology, University of Sydney, Sydney, Australia
- School of Mathematics and Statistics, University of Sydney, Sydney, Australia
- School of Molecular Bioscience, University of Sydney, Sydney, Australia

### International Partners

- Krembil Research Institute and University Health Network, University of Toronto, Canada
- Artificial Intelligence Laboratory, University of Illinois at Chicago, Chicago, USA
- Royan Institute for Reproductive Biomedicine, Tehran, Iran

## Conference Presentations & Invited Talks

### National Seminars

- 7/2019 Research Technology Seminar, University of New South Wales, Sydney, Australia
- 8/2017 Biotechnology & Biomolecular Seminars, University of New South Wales, Sydney, Australia
- 6/2017 Sydney Bioinformatics Research Symposium, University of Sydney, Sydney, Australia
- 9/2016 Statistical Bioinformatics Seminar, University of Sydney, Sydney, Australia
- 10/2014 Kolling Institute of Medical Research, Translational Research Meeting, Sydney, Australia  
Topic: Systems Biology: Towards understanding the molecular mechanism of complex diseases.
- 5/2014 Kolling Institute of Medical Research, Bill Walsh Cancer Research, Sydney, Australia  
Topic: Systems Biology: To unravel the molecular complexity underpinning pathogenesis.

- 12/2013 University of Sydney, Charles Perkins Centre, Sydney, Australia  
Topic: Systems Biology: Towards understanding pathogenesis molecular complexity.
- 10/2013 Royan Institute, Reproductive Biomedicine and Stem Cell, Tehran, Iran  
Topic: Modelling of cellular processes–application in stress activated pathways in chronic diseases
- 8/2011 University of Toronto, Toronto, Canada, Topic: Functional Gene Association Prediction.
- 6/2011 Harvard Medical School, Brigham and Women’s Hospital, Boston, USA  
Topic: Genetic Algorithms, Introduction, Applications, and Parameter Adaptation.
- 5/2010 University of Illinois at Chicago, Maths, Stats & Computer Science Seminar, Chicago, USA  
Topic: Genetic Algorithms: Theory and Practice.

### International Conferences

- 7/2015 Intl. Conference on Health Informatics and Technology, Valencia, Spain  
Topic: Analysis of long non-coding RNAs expression profiles in ovarian cancer-associated fibroblasts.
- 7/2010 Genetic and Evolutionary Computation Conf. (GECCO 2010), Portland, USA  
Topic: Optimizing Genetic Operator Rates Using a Markov Chain Model of GAs.
- 10/2009 International Conf. on Machine Learning and Applications (ICMLA 09), Miami, FL USA  
Topic: A Genetic Algorithm That Adapt Mutation Based On an Evolutionary Model.
- 12/2008 International Conf. on Machine Learning and Applications (ICMLA 08), San Diego, USA  
Topic: Adaptively Evolving Probabilities of Genetic Operators.

### Past Projects

- 8/2011– **University of Toronto**, *University Health Network, Ontario Cancer Institute.*  
8/2012 Toronto, Canada
- Gene functional association predictor (GAP): predicting & prioritizing gene functional associations.
  - Antibiotics effectiveness quantification in the treatment of lung cancer.
  - Biomarker identification and survival analysis in non-small-cell lung cancer.
- 8/2008– **University of Illinois at Chicago**, *Department of Computer Science.*  
9/2009 Chicago, USA
- Survey on multiple network alignment, *Computational Biology.*
  - Comparing cooperative caching in mobile p2p DBs, Course: *Database Management Systems.*
  - Sentiment classification of movie reviews, Course: *Statistical Natural Language Processing.*
  - Household vehicle ownership prediction, Course: *Artificial Neural Network.*
  - Search engine evaluation prediction, Course: *Text and Data Mining.*
  - Usability test: verification study of WinEdt IDE, Course: *Human Computer Interaction.*
  - Knowledge base logical expert system design for “family doctor”, Course: *Expert Systems.*
  - Binary search tree editor design by Smalltalk, Course: *Object Oriented Programming Lang.*

### Industrial Work Experience

- 2/2007– **Motorola, Inc.**, *Physical Realization Research Center, and Active Lifestyles Project.*  
6/2008 Schaumburg, USA
- Working with the Active Lifestyles team to develop machine learning algorithms that can guide users with meaningful, specific feedback to aid them in maintaining their target heart rate during an activity (running, walking, etc.).
  - Collaborating with Physical Realization Research Center of Motorola Labs to enhance the performance of the Genetic Programming Algorithms.