Basel Wael Abu-Jamous (CV)

Post-Doctorate Research Assistant in Bioinformatics

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Member of the ISCB (2017) and the Jordan Engineers Association (2010)
Previous member of the IEEE (2009-2016)

Current Research Summary

I **develop** and **apply** computational methods which address various biological questions by analysing high-throughput datasets, especially the comprehensive and collective cluster analysis of multiple genome-wide transcriptomic (gene expression) datasets. I handle the entire analysis pipeline including fetching data from repositories, pre-processing and normalisation, differential expression analysis, cluster analysis using the algorithms which I developed, numerical and biological validation, biological reasoning of the results by enrichment tools, comparison with the literature, presenting and discussing results in conferences and meetings with biological/biomedical colleagues or collaborators, drawing hypotheses, writing and submitting manuscripts, and contributing to grant applications. **Currently**, I work in Dr Steve Kelly's laboratory at the University of Oxford within the C4 Rice Project, which aims to improve photosynthetic efficiency in rice and thus to enhance crop yields. **Previously**, I worked with various established collaborators to analyse *omic* data from areas including breast cancer, erythropoiesis, malaria, yeast, and bacteria, as well as fMRI brain data.

Employment

07/2016 – Post-Doctorate Research Assistant – Bioinformatics
Department of Plant Sciences
University of Oxford, Oxford, UK

01/2015 – 06/2016 Post-Doctorate Research Assistant – Bioinformatics
Department of Electronic and Computer Engineering
Brunel University London, Uxbridge, UK

Education

2013 – 2015 **PhD** Electrical Engineering and Electronics / Bioinformatics
Brunel University London, Uxbridge, Greater London, UK
Thesis title: collective analysis of multiple high-throughput gene expression datasets
Viva (examination) date: 3rd June 2015 Awarding date: 7th July 2015
Recipient of the *Dean's Prize for Innovation and Impact in Doctoral Research* (December 2015)

2011 – 2013 **Research student** in Electrical Engineering and Electronics / Bioinformatics
University of Liverpool, Liverpool, UK
Research field: bioinformatics and information engineering (machine learning)
Completed after transferring with my supervisor to Brunel University London in April 2013

2010 – 2011 **MSc (Eng)** Information and Intelligence Engineering
University of Liverpool, Liverpool, UK
Thesis title: the analysis of microarray data
Average: 90% (Distinction) Class rank: 1st
Recipient of the *Sir Robin Saxby Prize* (October 2011)

2006 – 2010 **BSc (Eng)** Computer Engineering
University of Jordan, Amman, Jordan
Graduation project title: autonomous chess playing robot
GPA: 3.75/4.0 (Excellent) Class rank: 2nd

Other Training and Minor Employment Posts

2013 – 2014 Lab Demonstrator, **Brunel University London**, Uxbridge, UK
2012 – 2013 Lab Demonstrator, **University of Liverpool**, Liverpool, UK
06/2010 – 08/2010 Software Engineer (Trainee), **Leading Point**, Amman, Jordan (http://www.leading-point.com)
Development of solutions for telecom industry using ASP.NET, C#.NET and Java.

Languages

1) Arabic: Native
2) English: Excellent command

Technical Skills

1) Research skills: brainstorming, problem locating and solving, promising research identification, results analysis and reasoning, self-learning, technical writing, documentation, presentation, and academic skills.
2) Computer programming: Python (excellent), MATLAB (excellent), R (very good), Perl (very good), C#.NET (very good), C++, VB.NET, Java, F#, ASP.NET, XAML and PIC, Intel, and ARM Assembly.

Awards and Achievements

1) **Dean's Prize for Innovation and Impact in Doctoral Research** within the Department of Electronic and Computer Engineering, Brunel University London. This prestigious prize is given to single PhD graduate within each department in every round of graduation. (December 2015).
2) **One of the top 14 papers** presented in the IEEE International Workshop on Machine Learning for Signal Processing (MLSP) 2013. Consequently I was invited to write a full journal paper. (September 2013).
3) **Second place** in the posters section of the 6th Annual Student Research Conference 2013 at Brunel University London. (June 2013).
4) **Full PhD scholarship** at Brunel University London under the project (Ref. NIHR-RP-PG-0310-1004-AN) supported by the UK National Institute for Health Research (NIHR). (April 2013 to December 2014).
5) **Partial PhD scholarship** (All fees + partial maintenance) at the University of Liverpool under the project (Ref. NIHR-RP-PG-0310-1004-AN) supported by the UK NIHR. (November 2011 to March 2013).
6) **The Sir Robin Saxby Prize** for being the top student in the M.Sc. degree class of 2011 at the Department of Electrical Engineering and Electronics, the University of Liverpool. (October 2011).
7) **Second place** in the 3rd National Technology Parade, for the "Autonomous Chess Playing Robot project", Jordan University of Science and Technology. (May 2010).
8) **Top 70 out of more than 700** teams participated in the IEEEXtreme global programming contest. I was a member of a team of three. (November 2009).
9) **First place** in the ACM programming contest, The University of Jordan. (June 2009).
10) **First place** in "Dev Challenge" projects contest, for the "New Master Slave Model for Distributed Genetic Algorithms" project, University of Jordan. (May 2009).

Projects

1) The C4 Rice Project: involves 12 institutes from 8 countries.
2) Erythropoiesis in Heath and Disease: funded by the British NIHR (NIHR-RP-PG-0310-1004-AN).
3) Transcriptomic analysis of budding yeast throughout its cell-cycle and under different metabolic conditions.
4) Analysis of Microarray Data (MSc Project).
5) Autonomous Chess Playing Robot (BSc Graduation Project) – *Team leader*.
6) New Master Slave Model for Distributed Genetic Algorithms – *Team leader*.

Conferences attended

1) The Next Generation Sequencing conference (NGS), April 2017, Barcelona, Spain. I gave an oral presentation.
2) The premier International Conference on Acoustics, Speech, and Signal Processing (ICASSP), April 2015, Brisbane, Queensland, Australia.
3) The premier International Conference on Acoustics, Speech, and Signal Processing (ICASSP), May 2014, Florence, Italy. I presented a poster.
4) The IEEE International Workshop on Machine Learning for Signal Processing (MLSP), September 2013, Southampton, UK. I delivered an oral presentation. My paper was ranked in the top fourteen papers and I was invited thereafter to submit a full paper to the *Journal of Signal Processing Systems*.
5) Two Brunel University Student Research Conferences (ResCon), June 2013 and June 2014. I presented a poster in 2013 and an oral presentation in 2014. In 2013, I won the second place prize.
6) Several conference-like research meetings in many UK and overseas locations. Four to forty bioinformatic, biological, biomedical, and biochemical leading researchers attend such meetings to present and discuss findings and progress in the different collaborative projects in which I was involved. I presented my findings orally in most of those meetings and was involved in several discussions.

Appendix: Full list of publications

Books and book chapters

1) Basel Abu-Jamous, Chao Liu, David J. Roberts, Elvira Brattico, Asoke K. Nandi. "Data-driven analysis of collections of big datasets by the Bi-CoPaM method yields field-specific novel insights" in *Frontiers in Electronic Technologies*, *Springer*, 2017, ISBN: 9789811042348.
2) Basel Abu-Jamous, Rui Fa, and Asoke K. Nandi. "Integrative cluster analysis in bioinformatics". *John Wiley & Sons*, 2015, ISBN: 978-1118906538.

Journal publications

1) Basel Abu-Jamous, Francesca M. Buffa, Adrian L. Harris, Asoke K. Nandi. "In vitro downregulated hypoxia transcriptome is associated with poor prognosis in breast cancer". *Molecular Cancer*, 2017, **16**: 105. Link.
2) Peng Wang, Shanta Karki, Akshaya Biswal, Hsiang-Chun Lin, Mary Jacqueline Dionora, Govinda Rizal, Xiaojia yin, Mara Schuler, Tom Hughes, Jim Fouracre, Basel Abu-Jamous, Olga Sedelnikova, Shuen-Fang Lo, Anindya Bandyopadhyay, Su-May Yu, Steve Kelly, Paul Quick, Jane Langdale. "Candidate regulators of early leaf development in maize perturb hormone signalling and secondary cell wall formation when constitutively expressed in rice". *Scientific Reports*, 2017, In Press.
3) Alison T. Merryweather-Clarke*****, Alex J. Tipping*****, Abigail A. Lamikanra*****, Rui Fa*****, Basel Abu-Jamous*****, Hoi Pat Tsang, Lee Carpenter, Kathryn J. H. Robson, Asoke K. Nandi, David J. Roberts. "Distinct gene expression program dynamics during erythropoiesis from human induced pluripotent stem cells compared with adult and cord blood progenitors". *BMC Genomics*, 2016, **17**: 817. Link. (*****Contributed equally).
4) Chao Liu, Basel Abu-Jamous, Elvira Brattico, Asoke K. Nandi. "Towards tunable consensus clustering for studying functional brain connectivity during affective processing". *International Journal of Neural Systems (IJNS)*, 2016, **27**(2): 1650042. Link.
5) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "UNCLES: Method for the identification of genes differentially consistently co-expressed in a specific subset of datasets". *BMC Bioinformatics*, 2015, **16**: 184. **HIGHLY ACCESSED**. Link.
6) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Application of the Bi-CoPaM method to five *Escherichia coli* datasets generated under various biological conditions". *Journal of Signal Processing Systems*, 2015, **79**(2): 159-166. Link.
7) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Comprehensive analysis of forty yeast microarray datasets reveals a novel subset of genes (APha-RiB) consistently negatively associated with ribosome biogenesis". *BMC Bioinformatics*, 2014, **15**: 322. **HIGHLY ACCESSED**. Link.
8) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Paradigm of Tunable Clustering using Binarization of Consensus Partition Matrices (Bi-CoPaM) for Gene Discovery". *PLOS ONE*, 2013, **8**(2): e56432. Link.
9) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Yeast gene CMR1/YDL156W is consistently co-expressed with genes participating in DNA-metabolic processes in a variety of stringent clustering experiments". *Journal of the Royal Society Interface*, 2013, **10**(81): 20120990. Link.
10) Fengyu Cong, Vinoo Alluri, Asoke K. Nandi, Petri Toiviainen, Rui Fa, Basel Abu-Jamous, Li-yun Gong, Bart G. W. Craenen, et al., "Linking brain responses to naturalistic music through analysis of ongoing EEG and stimulus features", *IEEE Transactions on Multimedia*, 2013, **15**(5): 1060-1069. Link.

Full-length international conference publications

1) Chao Liu, Rui Fa, Basel Abu-Jamous, Elvira Brattico, and Asoke K. Nandi. "Scalable clustering based on enhanced-smart for large-scale fMRI datasets". *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2015, Brisbane, Australia, 2015, pp. 962-966.
2) Rui Fa, Basel Abu-Jamous, David J. Roberts, and Asoke K. Nandi. "CoCE-SMART: consensus clustering based on enhanced splitting-merging awareness tactics". *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2015, Brisbane, Australia, 2015, pp. 2011-2015.
3) Chao Liu, Basel Abu-Jamous, Elvira Brattico, Asoke Nandi. "Clustering consistency in neuroimaging data analysis". *Proceedings of the International Conference on Fuzzy Systems and Knowledge Discovery (FSKD)*, 2015, Zhangjiajie, China, pp.1118-1122.
4) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "M-N scatter plots technique for evaluating varying-size clusters and setting the parameters of Bi-CoPaM and UNCLES methods". *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2014, Florence, Italy, pp. 6726-6730.
5) Rui Fa, Basel Abu-Jamous, David J. Roberts, and Asoke K. Nandi. "Splitting-while-merging framework for clustering high-dimension data with component-wise expectation conditional maximisation". *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2014, Florence, Italy, pp. 2932-2936.
6) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Bi-CoPaM ensemble clustering application to five *Escherichia coli* bacterial datasets". *Proceedings of the European Signal Processing Conference (EUSIPCO)*, 2014, Lisbon, Portugal.
7) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Identification of genes consistently co-expressed in multiple microarray datasets by a genome-wide Bi-CoPaM approach". *Proceedings of International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2013, Vancouver, Canada, pp. 1172-1176.

8) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Method for the identification of the subsets of genes specifically consistently co-expressed in a set of datasets". *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2013, Southampton, UK, doi: 10.1109/MLSP.2013.6661907.
9) Rui Fa, Basel Abu-Jamous, David J. Roberts, and Asoke K. Nandi. "Enhanced SMART framework for gene clustering using successive processing". *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2013, Southampton, UK, doi: 10.1109/MLSP.2013.6661964.
10) Rui Fa, Basel Abu-Jamous, and Asoke K. Nandi. "Bi-CoPaM ensemble clustering application to five *Escherichia coli* bacterial datasets". *Proceedings of the European Signal Processing Conference (EUSIPCO)*, 2013, Marrakech, Morocco.
11) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Hybrid binarisation technique for the Bi-CoPaM method". *Proceedings of the Constantinides International Workshop on Signal Processing (CIWSP)*, 2013, London, UK, doi: 10.1049/ic.2013.0006.
12) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Comprehensive analysis of multiple microarray datasets by binarization of consensus partition matrix". *Proceedings of the IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2012, Santander, Spain, paper no. 62, doi: 10.1109/MLSP.2012.6349787.
13) Basel Abu-Jamous, Rui Fa, David J. Roberts, and Asoke K. Nandi. "Binarization of consensus partition matrix for ensemble clustering". *Proceedings of the European Signal Processing Conference (EUSIPCO)*, 2012, Bucharest, Romania, pp. 2193-2197.
14) Rui Fa, Basel Abu-Jamous, and Asoke K. Nandi. "Development and evaluation of kernel-based clustering validity indices". *Proceedings of the European Signal Processing Conference (EUSIPCO)*, 2012, Bucharest, Romania, pp. 634-638.

Conference posters / talks (without full-length papers)

1) Basel Abu-Jamous and Steve Kelly, "Clust: automatic identification and optimisation of consensus clusters of co-expressed genes from multiple heterogeneous transcriptomic datasets". *Great Lakes Bioinformatics (GLBIO) conference*, 2017, Chicago, IL, USA. [Talk].
2) Basel Abu-Jamous and Steve Kelly, "Bi-CoPaM: an automated method to identify clusters of consistently co-expressed genes from multiple heterogeneous transcriptomic datasets". *Next Generation Sequencing (NGS) conference*, 2017, Barcelona, Spain. [Talk].
3) Basel Abu-Jamous and Steve Kelly, "Differential maturation of bundlesheath and mesophyll cells during photosynthetic activation in C_4 species". *Enhancing photosynthesis in crop plants: targets for improvement*, 2016, The Royal Society, London, UK. [Poster].
4) Chao Liu, Basel Abu-Jamous, Elvira Brattico, and Asoke K. Nandi. "Consensus clustering reveals neural networks during affective music processing". *The Neurosciences and Music V*, 2014, Dijon, France. [Poster].
5) Basel Abu-Jamous, Maysam Abbod, Asoke K. Nandi. "Comprehensive analysis of high throughput biological datasets". *Brunel Annual Student Research Conference (ResCon)*, 2014, London, UK. [Talk].
6) Basel Abu-Jamous, Maysam Abbod, Asoke K. Nandi. "Comprehensive analysis of high throughput biological datasets". *Brunel Annual Student Research Conference (ResCon)*, 2013, London, UK. [Poster].