

Dr Basel Wael Abu-Jamous

Lead Data Scientist / Bioinformatician

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Tel (UK): +44 (0) 755-188-9509
 Member of the ISCB (2017 – Present)
 Member of the Jordan Engineers Association (2010 – Present)

Passionate about developing and applying the next generation of data science, machine learning, and bioinformatics to facilitate leveraging anonymised real-world observational patient data, clinical trial data, and/or omic data to address problems facing the healthcare system and the pharmaceutical industry.

Employment

01/2019 – Present **Sensyne Health plc, Oxford, UK**

- 04/2021 – Present
Lead Data Scientist
 - I lead (sub-)teams applying data science to electronic healthcare record data to address problems for our clients from the pharmaceutical industry and partners from the healthcare system.
 - I sit at the interface between clients, our internal clinical team, and our data scientists.
- 12/2019 – 03/2021
Senior Data Scientist
 - A continuation of my previous role while mixing team leading and hands-on data science.
- 01/2019 – 11/2019
Bioinformatician – Scientist and Researcher
 - I contribute to projects analysing anonymised electronic healthcare record data from the NHS with tasks including discussing client requirements, planning, reporting, and hands-on implementation ranging from data cleaning to algorithmic developments and analysis.
 - I play a key role in projects involving genomic and multiomic data as an area in which I have a special interest and a lot of experience.

09/2020 – Present **Phi Science Institute, Amman, Jordan**

Senior Scientific Advisor

- I provide scientific consultation to projects in bioinformatics and clinical data science.
- I plan and deliver educational courses and seminars in bioinformatics and clinical data science as organised by the institute to its members and clients in Jordan and the region.

07/2016 – 01/2019 **University of Oxford, Oxford, UK**

Department of Plant Sciences

Post-Doctorate Research Assistant – Bioinformatics

- Discovered the previously unknown C₄ chloroplastic pyruvate exporter protein, which completed an entire C₄ photosynthesis cycle for the first time in history.
- Bioinformatically supported the C₄ Rice Project (<https://c4rice.com>) by analysis of NGS, genomic, transcriptomic, proteomic, metabolomics, and phylogenomic datasets.
- Designed, implemented, published, and released the *Clust* algorithm, which has the power to extract optimal co-expressed gene clusters from gene expression data automatically.
<https://github.com/BaselAbujamous/clust>; <http://clust.baselabujamous.com>

01/2015 – 06/2016 **Brunel University London, Uxbridge, UK**

Department of Electronic and Computer Engineering

Post-Doctorate Research Assistant – Bioinformatics

- Bioinformatically identified a prognostic hypoxia transcriptomic signature in breast cancer.
- Developed a bioinformatic algorithm, *UNCLES*, with the ability to apply unsupervised clustering to multiple transcriptomic datasets collectively.

Education

- 2013 – 2015 **PhD** Electrical Engineering and Electronics / Bioinformatics
Brunel University London, Uxbridge, Greater London, UK
 Project: “Erythropoiesis in Health and Disease” – UK NIHR funded (NIHR-RP-PG-0310-1004-AN)
 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
 Project: “Erythropoiesis in Health and Disease” – UK NIHR funded (NIHR-RP-PG-0310-1004-AN)
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>)

Languages

- 1) Arabic: Native 2) English: Fluent

Technical Skills

- 1) **Research skills/qualities:** bioinformatics, machine learning, statistics, software engineering, project planning, problem solving, analysis and reasoning, self-learning, self-motivation, and written and oral communication.
- 2) **Computer programming:** Python (excellent), MATLAB (excellent), Git (very good), R (very good), C#.NET (very good), Linux (very good), Perl (good), Microsoft Azure Cloud, ASP.NET, C++, VB.NET, and Java.
- 3) **Data:** Patient electronic health records (NHS data), NGS data, gene expression microarrays, genomics, proteomics, metabolomics, sequence alignment, phylogenetics

Major 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) **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).
- 3) **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).
- 4) **First place** in the ACM programming contest, The University of Jordan. (June 2009).
- 5) **First place** in “Dev Challenge” projects contest, for the “New Master Slave Model for Distributed Genetic Algorithms” project, University of Jordan. (May 2009).

All publications are listed in the Appendix below

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 (N = 15, *first or joint first author = 9)

- *1) Basel Abu-Jamous*, Arseni Anisimovich*, Janie Baxter, Lucy Mackillop, Marcela P Vizcaychipi, Alex McCarthy, Rabia T Khan, "Associations of comorbidities and medications with COVID-19 2 outcome: A retrospective analysis of real-world evidence data". *medRxiv*, 2020, doi: 10.1101/2020.08.20.20174169. [Preprint Link](#).
- 2) Fernando Andreotti, Frank S. Heldt, Basel Abu-Jamous, Ming Li, Avelino Javier, Oliver Carr, Stojan Jovanovic, Nadezda Lipunova, Benjamin Irving, Rabia T. Khan, Robert Dürichen, "Prediction of the onset of cardiovascular diseases from electronic health records using multi-task gated recurrent units". *arXiv*, 2020, arXiv2007.08491. [Preprint link](#).
- 3) Daniela Vlad, Basel Abu-Jamous, Peng Wang, Jane Langdale, "A modular steroid-inducible gene expression system for use in rice". *BMC Plant Biology*, 2019, **19**: 426. [Link](#).
- *4) Basel Abu-Jamous and Steven Kelly, "Clust: automatic extraction of optimal co-expressed gene clusters from gene expression data". *Genome Biology*, 2018, **19**: 172. [Link](#).
- *5) 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](#).
- 6) Chao Liu, Elvira Brattico, Basel Abu-Jamous, Carlo S. Pereira, Thomas Jacobsen, Asoke K. Nandi. "Effect of explicit evaluation on neural connectivity related to listening to unfamiliar music". *Frontiers in Human Neuroscience*, 2017, **11**: 611. [Link](#).
- 7) 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, **7**: 4535. [Link](#).
- *8) 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).
- 9) 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](#).
- *10) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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. [Link](#).
- *11) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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](#).
- *12) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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. [Link](#).
- *13) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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](#).
- *14) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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](#).
- 15) 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 (N = 16, *first or joint first author = 8)

- *1) Basel Abu-Jamous, Steven Kelly. "Simultaneous Clustering of Multiple Heterogeneous Gene Expression Datasets". *Proceedings of the IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies (AEECT)*, Amman, Jordan, 2017.
- 2) Chao Liu, Elvira Brattico, Basel Abu-Jamous, Asoke Nandi. "Exploration of distance metrics in consensus clustering analysis of fMRI data". *Proceedings of the 22nd International Conference on Digital Signal Processing (DSP)*, London, UK, 2017.
- 3) Chao Liu, Rui Fa, Basel Abu-Jamous, Elvira Brattico, 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.

- 4) Rui Fa, Basel Abu-Jamous, David J. Roberts, 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.
- 5) 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.
- *6) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- 7) Rui Fa, Basel Abu-Jamous, David J. Roberts, 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.
- * 8) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- * 9) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- * 10) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- 11) Rui Fa, Basel Abu-Jamous, David J. Roberts, 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.
- 12) Rui Fa, Basel Abu-Jamous, 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.
- * 13) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- * 14) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- * 15) Basel Abu-Jamous, Rui Fa, David J. Roberts, 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.
- 16) Rui Fa, Basel Abu-Jamous, 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 *C₄* species". *Enhancing photosynthesis in crop plants: targets for improvement*, 2016, The Royal Society, London, UK. [Poster].
- 4) Chao Liu, Basel Abu-Jamous, Elvira Brattico, 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].