

# DR. SHAHIN ROSTAMI

Forename: Shahin                      Surname: Rostami  
Birthplace: Bournemouth, UK      Gender: Male

**Founder and Principal Data Science Consultant** at Polyra Limited  
**Visiting Scholar (Fellow)** at Bournemouth University  
**Experience in both Industry and Academia**



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## BIOGRAPHY

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Jul 2021                      I'm the Founder & Principal Data Science Consultant at Polyra Limited, a company specialising in Data Science Research, Development, and Consulting. I hold a Ph.D. in the field of Artificial Intelligence with applications to Concealed Weapon Detection. My research interests lie within Data Science and Artificial Intelligence, ranging from theory to their application to Digital Healthcare and Threat Detection.

Before my leap back into industry research & development as the Head of Data Science at Xim Limited,, I held the position of Senior Academic (Associate Professor) in Data Science & Artificial Intelligence at Bournemouth University, where I was a faculty member for 7 years, and now contracted as a Visiting Scholar. I continue my academic activities and collaboration with many universities through joint publications and reviewing for high-impact journals and conferences, organisation and chairing of special sessions and conferences, supervision of PhD students, guest lectures, and open access dissemination of research and education content e.g. on YouTube.

I have authored [four books](#) on the subjects of Data Science, Visualisation, and Evolutionary Computation. I have also authored and published [Plotapi.com](http://Plotapi.com), a full-featured visualisation API for producing beautiful interactive visualisations that has been used in publications by companies and institutions in industry, government, and academia.

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## ACADEMIC QUALIFICATIONS

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Dec 2014                      **PhD in Computational Intelligence and Machine Learning** with Manchester Metropolitan University, UK. Thesis: "Preference Focussed± Many-Objective Evolutionary Computation".  
Aug 2010                      **BSc (Hons) Computing - First Class** with the Manchester Metropolitan University, UK.  
Dec 2017                      **Senior Teaching Fellow (D3)**  
Feb 2016                      **Teaching Fellow (D2)** of the UK Professional Standards Framework, Advance HE (formerly Higher Education Academy).  
Jan 2012                      **PGCAP Teaching and Learning** with Manchester Metropolitan University, UK.

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## COMPUTER LITERACY

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Prog. Languages              Python, C#, C/C++, MATLAB, PHP, JavaScript, Rust, Java, Visual Basic.  
Databases                      Redis, SQLite, PostgreSQL, MySQL, Microsoft SQL, Oracle (SQL, PL/SQL).  
Technical Software           SciPy ecosystem (e.g. NumPy, Pandas, Dask, Scikit-learn), TensorFlow, Keras, Jupyter Lab+Notebook, Plotly+Dash, D3.js, FastAPI, .NET Framework, Strapi, Docker, Unity3d, AWS. LaTeX, Unix shell.

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**EMPLOYMENT HISTORY**


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Feb 2018 - Aug 2021	<b>Head of Data Science,</b> (formerly Principal Data Science Consultant) with Xim Limited, UK.
May 2021 - Current	<b>Visiting Scholar,</b> Faculty of Science and Technology, Bournemouth University, UK.
Mar 2019 - Current	<b>Founder and Principal Data Science Consultant</b> Polyra Limited, UK.
Aug 2014 - Mar 2021	<b>Senior Academic (Associate Professor) in Data Science</b> (formerly Lecturer in Computing, and Demonstrator in Computing) Department of Computing & Informatics, Faculty of Science & Technology, Bournemouth University, UK.
Sep 2011 - Aug 2014	<b>Associate Lecturer, Graduate Tutor, and Demonstrator,</b> Manchester Metropolitan University, UK.
Apr 2010 - Nov 2010	<b>Software Engineer,</b> Building Blocks (UK) Ltd., Manchester, UK.
Jun 2008 - Feb 2010	<b>Software Developer</b> Havas Lynx (formerly Creative Lynx Ltd.), Manchester, UK.

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**CONSULTING HISTORY**


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Jun 2021 - Jan 2022	<b>Artificial Intelligence Advisor,</b> Consulting with a Digital Health Company on Experiment Design and Data Collection for Disease Diagnosis through the Measurement of Volatile Organic Compounds (VOCs).
Apr 2021 - May 2021	<b>Principal Data Visualisation Consultant,</b> Consulting on, Designing, Implementing, and Documenting a Custom Data Visualisation Component for Time Series Healthcare Signal Data from Multiple Organs.
Feb 2018 - Feb 2021	<b>Principal Data Science Consultant,</b> Leading the Data Science and Machine Learning Team at a well-funded Digital Health Company Focussed on the Contactless Measurement of Vital Signs.
Oct 2020 - Jan 2021	<b>Principal Data Visualisation Consultant,</b> Consulting on, Designing, and Implementing a Custom Data Visualisation on Management of Risk Factors and Goals for Dementia Prevention through Behavioural Change.
Dec 2019 - Dec 2020	<b>Principal Machine Learning Consultant,</b> Consulting with an Unmanned Aerial Vehicle Company. Analysing, Wrangling, and Modelling Multiple Sensor Data To Rapidly Detect Unexploded Ordnance.
May 2020 - July 2020	<b>Principal Curriculum Consultant,</b> Consulting on, Designing, and Producing 17 Educational Videos for a Series A funded (\$10 million) Headless CMS and API Customisation Company.
Sep 2019 - Feb 2020	<b>Principal Data Science Consultant,</b> Consulting on, Analysing, Cleaning, Wrangling, and Modelling Electrophysiological and Cerebral Circulation Data for the Diagnosis of Cognitive Impairment.
Dec 2019 - Jan 2020	<b>Principal Machine Learning Consultant,</b> Consulting with an Unmanned Aerial Vehicle Company. Analysing, Wrangling, and Modelling Video and Thermal Imagery to Prototype a Computer Vision Model for the Detection and Classification of Livestock.
Mar 2019 - Sep 2019	<b>Principal Data Science Consultant,</b> Consulting on, Analysing, Cleaning, Wrangling, and Modelling Breath Biomarkers to Diagnose and Monitor Diabetes. In collaboration with multiple universities and SMEs.
Jun 2008 - Feb 2010	<b>Senior Software Engineering Consultant,</b> Consulting on, Designing, and Leading the Implementing of a Session Management System for Driving Instructors and Students.

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**MANAGERIAL AND LEADERSHIP EXPERIENCE**


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Feb 2021 - Current	<b>Head of Data Science</b> with Xim Limited, UK.
Feb 2018 - Feb 2021	<b>Leading Data Science Consultant,</b> Lifelight® Medical Device, Xim Limited, UK.
Apr 2019 - Mar 2021	<b>Quality Assurance and Enhancement Group (QAEG) Member,</b> nominated and successful for post, Bournemouth University, UK.

Apr 2017 - Mar 2021	<b>Course Leader</b> , MSc Data Science and Artificial Intelligence, MSc Digital Health and Artificial Intelligence, and MSc Applied Data Analytics, Bournemouth University, UK
Jan 2016 - Jan 2019	<b>University Education Steering Group Member</b> , (V4L Group) Representing the Faculty of Science & Technology, Bournemouth University, UK.
Jan 2016 - Mar 2021	<b>Research Mentor</b> to Dr. Gernot Liebchen, Bournemouth University, UK.
Aug 2015 - Sep 2017	<b>External Moderator</b> for Bournemouth & Poole College, UK..
May 2015 - Dec 2015	<b>Coordinator</b> of the Intelligent Systems Group, Bournemouth University, UK.

## TEACHING EXPERIENCE

A wealth of teaching experience after over a decade in academia from undergraduate to postgraduate level. Subjects in the areas of Data Science, Artificial Intelligence, and Software Engineering. Details available in [full CV](#).

## SUPERVISION

### PhD, Postgraduate Research Student

Sep 2019 - Ongoing	<b>Daniel Dimanov</b> , Bournemouth University, Thesis: “Multi-Objective Concealed Weapon Detection”, 1st supervisor, with Dr. Emili Balaguer-Ballester.
Jan 2017 - Ongoing	<b>Kevin Wilson</b> , Bournemouth University, Thesis: “Many-Objective Evolutionary Computation”, 1st supervisor with Prof. Siamak Noroozi.
Sep 2016 - Completed	<b>Waqas Jamil</b> , Bournemouth University, Thesis: “Sketches and Online Learning”, 2nd supervisor with Prof. Hamid Bouchachia.
Apr 2016 - Completed	<b>Mohammed Alqurashi</b> , Bournemouth University, Thesis: “An Intrusion Detection System for IoT Enabled Devices”, 2nd supervisor with Prof. Vasilis Katos.

### Research Assistants

Sep 2018 - Nov 2020	<b>Saygun Guler</b> , Bournemouth University, Project: “Non-contact remote monitoring of human vital signs: defining the “art of the possible”.
Sep 2017 - Aug 2018	<b>Donya Rahmani</b> , Bournemouth University, Project: “Pattern Recognition and Data Quality in EEG data-sets.”.
Sep 2016 - Aug 2017	<b>Sherin Varghese</b> , Bournemouth University, Project: “EEG data-set for Adaptive Computer Interfaces for Improved Productivity and Personal Health.”.
Sep 2016 - Aug 2017	<b>Flynn Acworth</b> , Bournemouth University, Project: “Visualisation of the Evolutionary Computation Process to Improve Understanding and Track Erroneous Behaviour.”.
Sep 2015 - Completed	<b>Michele Di Lecce</b> , Technical University of Bari, Italy, Thesis: “An accelerated Selection Method for Many-Objective Optimization”, Invited supervisor with Prof. Ferrante Neri.
Sep 2018 - Aug 2018	<b>Kiril Gyaurski</b> , Bournemouth University, Project: “Performance analysis of highly cited evolutionary multi-objective optimisation algorithms”.
Sep 2019 - Sep 2020	<b>Daniel Dimanov</b> , Bournemouth University, Project: “Neuroevolution for Weapon Detection”.
Sep 2018 - Sep 2019	<b>James Turner</b> , Bournemouth University, Project: “Blood Pressure Estimation using rPPG”.

## FUNDED PROJECTS AND AWARDS

### Externally Funded Projects

Nov 2019	<b>Multi Sensor Fusion and Machine Learning for Unmanned Detection of Unexploded Ordnance</b> , awarded by Defence Science and Technology Laboratory (DSTL), as Principal Investigator, Bournemouth University. <u>Total: £51,199</u>
May 2019	<b>The State of Cybersecurity Vulnerabilities in 2018</b> , awarded by the European Union Agency for Network and Information (ENISA), as Co-Investigator (leading data science work package) with Principal Investigator Prof. Vasilis Katos, Bournemouth University. <u>Total: £66,956</u>
Feb 2019	<b>Multi-Objective Concealed Weapon Detection</b> , match-funded PhD between CountingLab Ltd and Bournemouth University as Principal Investigator. <u>Total: £25,836</u>
July 2018	<b>SPEED - Smart Ports Entrepreneurial Ecosystem Development</b> , awarded by the European Regional Development Fund (ERDF) - Interreg 2 Seas Programme, as Co-Investigator (during application process only, left project), Bournemouth University. <u>Total: €393,783.75</u>

Sep 2016 - Sep 2018	<b>EduWeb - Combatting Digital Exclusion: Children Educate Digital Illiterate Adults in Safe and Creative Web</b> , awarded by the European Commission, as Researcher with Principal Investigator Prof. Vasilis Katos, Bournemouth University. <u>Total: £195,181.00</u>
Mar 2018	<b>Non-contact remote monitoring of human vital signs: the art of the possible</b> , match-funded PhD between Xim Ltd. and Bournemouth University as Principal Investigator. Total: <u>£22,800.00</u>
Apr 2015	<b>New multidisciplinary adaptive computer interfaces for improved productivity and personal health</b> , awarded by NVIDIA CORPORATION, as Principal Investigator, Bournemouth University. Research Equipment <u>Total Value: £1,200.00</u>

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#### Internally Funded Projects

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July 2019	<b>Co-production of a self-management app for people using crisis recovery services</b> , as Co-Investigator with Dr. Tula Brannelly, Bournemouth University, <u>Total: £9,734.17</u>
Apr 2018	<b>Towards a scalable exact hypervolume indicator</b> , Bournemouth University. Total: <u>£1,708.56</u> .
Mar 2017	<b>An investigation into falsely classified samples in pattern recognition models</b> , awarded by Bournemouth University with Dr. Gernot Liebchen. <u>Total: £1500</u>
Feb 2017	<b>Visualisation of the Evolutionary Computation Process to Improve Understanding and Track Erroneous Behaviour</b> , awarded by Bournemouth University. <u>Total £2500</u>
Dec 2016	<b>EEG data-set for Adaptive Computer Interfaces for Improved Productivity and Personal Health</b> , awarded by Bournemouth University. <u>Total: £2000</u>
Oct 2015	<b>New multidisciplinary adaptive computer interfaces for improved productivity and personal health</b> , with Dr. Nan Jiang, awarded by Bournemouth University. <u>Total: £8,826</u>

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#### LIST OF PUBLISHED SOFTWARE

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- [S3] **Plotapi**, a full-featured visualization API, producing beautiful interactive visualizations.  
 Website: <https://plotapi.com>
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- [S2] **Chord Pro**, a full-featured chord visualization API, producing beautiful interactive visualizations. Used by departments in different universities, governments. For Python, Rustlang, & more. 228 Stars, 17/06/2021.  
 Website: <https://datacrayon.com/shop/product/chord-pro/>, Repository: <https://github.com/shahinrostami/chord>
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- [S1] **Purple Please**, an extension for Jupyter Lab extension which provides the Purple Please theme, used by many internationally and regularly downloaded on a weekly basis. 55 Stars, 17/06/2021.  
 Website: <https://www.npmjs.com/package/@shahinrostami/>, Repository: <https://github.com/shahinrostami/theme-purple-please>.
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#### RESEARCH CITIZENSHIP

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##### Journal Reviewer

Jun 2016 - Jun 2020	<b>Frontiers in Computational Neuroscience (FNCOM)</b> , Frontiers.
Jun 2016 - Current	<b>Integrated Computer-Aided Engineering (ICAE)</b> , IOS Press.
Sep 2016 - Current	<b>International Journal of Neural Systems (IJNS)</b> , World Scientific.
Sep 2015 - Current	<b>Information Sciences (INS)</b> , Elsevier.
Sep 2015 - Current	<b>Swarm and Evolutionary Computation (SWEVO)</b> , Elsevier.
Sep 2015	<b>Expert Systems with Applications (EWSA)</b> Elsevier.
Sep 2015	<b>Computers &amp; Security (COSE)</b> , Elsevier.

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##### Conference Organisation

Sep 2018 - Sep 2019	<b>18 &amp; 19th UK Workshop on Computational Intelligence (UKCI)</b> , Programme Committee.
May 2018	<b>IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology 2018 (IEEE CIBCB 2018)</b> . Programme Committee
Oct 2017	<b>IEEE International Conference on Data Science and Advanced Analytics 2-017 (IEEE DSAA 2017)</b> , Programme Committee.
Aug 2017	<b>Machine Learning in Medical Diagnosis and Prognosis</b> , Special Session at the IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology (IEEE CIBCB 2017). Co-Organiser and Session Chair.
Apr 2017	<b>British Conference of Undergraduate Research 2017 (BCUR 2017)</b> , Scientific Committee.
Mar 2017	<b>IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology 2017 (IEEE CIBCB 2017)</b> . Programme Committee.

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##### Research Visits

Jul 2018	<b>Centre for Computational Intelligence, De Montfort University, UK</b> , Visiting Researcher, invited by Prof. Ferrante Neri, Project: "Algorithmic Design Issues in Neuroevolution".
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**LIST OF RESEARCH PUBLICATIONS****Refereed Journal Articles**

- [J8] Neri, F., & Rostami, S. (2021). Generalised Pattern Search Based on Covariance Matrix Diagonalisation. *SN Computer Science*, 1-22.
- [J7] Rostami, S., Neri, F., & Gyaurski, K. (2020). On Algorithmic Descriptions and Software Implementations for Multi-objective Optimisation: A Comparative Study. *SN Computer Science*, 1(5), 1-23.
- [J6] Rostami, S., & Neri, F. (2017). A fast hypervolume driven selection mechanism for many-objective optimisation problems. *Swarm and evolutionary computation*, 34, 50-67.
- [J5] Rostami, S., Neri, F., & Epitropakis, M. (2017). Progressive preference articulation for decision making in multi-objective optimisation problems. *Integrated Computer-Aided Engineering*, 24(4), 315-335.
- [J4] Tsimperidis, I., Rostami, S., & Katos, V. (2017). Age detection through keystroke dynamics from user authentication failures. *International Journal of Digital Crime and Forensics (IJDCF)*, 9(1), 1-16.
- [J3] Rostami, S., & Neri, F. (2016). Covariance matrix adaptation pareto archived evolution strategy with hypervolume-sorted adaptive grid algorithm. *Integrated Computer-Aided Engineering*, 23(4), 313-329.
- [J2] Rostami, S., & Shenfield, A. (2017). A multi-tier adaptive grid algorithm for the evolutionary multi-objective optimisation of complex problems. *Soft Computing*, 21(17), 4963-4979.
- [J1] Rostami, S., O'Reilly, D., Shenfield, A., & Bowring, N. (2015). A novel preference articulation operator for the evolutionary multi-objective optimisation of classifiers in concealed weapons detection. *Information Sciences*, 295, 494-520.

**Articles in Refereed Conference Proceedings, Post-proceedings, and Edited Book**

- [C14] Rostami, S., Kleszcz, A., Dimanov, D., & Katos, V. (2020, October). A Machine Learning Approach to Dataset Imputation for Software Vulnerabilities. In *International Conference on Multimedia Communications, Services and Security* (pp. 25-36). Springer, Cham.
- [C13] Tsimperidis, I., Rostami, S., Wilson, K., & Katos, V. (2020, September). User Attribution Through Keystroke Dynamics-Based Author Age Estimation. *International Networking Conference* (pp. 47-61). Springer, Cham.
- [C12] Neri, F., & Rostami, S. (2020, April). A Local Search for Numerical Optimisation Based on Covariance Matrix Diagonalisation. *International Conference on the Applications of Evolutionary Computation (Part of EvoStar)* (pp. 3-19). Springer, Cham.
- [C11] Dimanov, D. and Rostami, S. (2019). KOSI- Key Object Detection for Sentiment Insights, 19th annual UK workshop on computational intelligence, 4-6 September 2019, Portsmouth, UK.
- [C10] Stubbs, R. and Rostami, S. (2019). Hyper-parameter Optimisation by Restrained Stochastic Hill Climbing, UKCI 2019: 19th annual UK workshop on computational intelligence, 4-6 September 2019, Portsmouth, UK.
- [C9] Saul, M.A. and Rostami, S. (2018). A Comparison of Resampling Techniques for Pattern Classification in Imbalanced Data-Sets, UKCI 2018: 18th annual UK workshop on computational intelligence, 5-7 September 2018, Nottingham, UK.
- [C8] Wilson, K. and Rostami, S. (2018). On the Integrity of Performance Comparison for Evolutionary Multi-objective Optimisation Algorithms, UKCI 2018: 18th annual UK workshop on computational intelligence, 5-7 September 2018, Nottingham, UK.
- [C7] Nava, T., Rostami, S. and Smyth, B. (2018). Knowing the unknown: visualising consumption blind-spots in recommender systems. In: *SAC 2018 The 33rd ACM/SIGAPP Symposium On Applied Computing*, 9-13 April 2018, Pau, France.
- [C6] Shenfield, A., & Rostami, S. (2017). Multi-objective evolution of artificial neural networks in multi-class medical diagnosis problems with class imbalance. *2017 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)*.
- [C5] Shenfield, A., & Rostami, S. (2015). A multi objective approach to evolving artificial neural networks for coronary heart disease classification. *2015 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology, Niagara Falls, ON*.
- [C4] Rostami, S., Shenfield, A., Sigurnjak, S., & Fakorede, O. (2015). Evaluation of mental workload and familiarity in human computer interaction with integrated development environments using single-channel EEG. In *Proceedings of PPIG 2015-26th Annual Workshop*.
- [C3] Rostami, S., Delves, P., & Shenfield, A. (2013). Evolutionary Multi-Objective Optimisation of an Automotive Active Steering Controller. In *Science and Engineering Research Symposium* (pp. 1-3).
- [C2] Rostami, S., & Shenfield, A. (2012, September). Cma-paes: Pareto archived evolution strategy using covariance matrix adaptation for multi-objective optimisation. In *Computational Intelligence (UKCI), 2012 12th UK Workshop on* (pp. 1-8). IEEE.
- [C1] Rostami, S., & Shenfield, A. (2012). Adaptive Grid Archiving Combined with the Covariance Matrix Adaptation Evolution Strategy.

**Textbooks**

- [T4] Rostami, S. (2020). *Visualisation with D3.js*. Published by Data Crayon.
- [T3] Rostami, S. (2020). *Data is Beautiful*. Published by Data Crayon.
- [T2] Rostami, S. (2020). *Data Analysis with Rust Notebooks*. Published by Data Crayon.
- [T1] Rostami, S. (2019). *Practical Evolutionary Algorithms*. Published by Data Crayon.