

Bashir M. Al-Hashimi Commander of the British Empire (CBE) FREng FRS
Arm Professor of Computer Engineering

Professor Bashir M. Al-Hashimi is Arm Professor of Computer Engineering (since 2007) and a prominent world-leading computer engineer, who has made significant academic contributions to system-on-chip manufacturing test and to understanding interactions between the hardware and software of energy-efficient computing and their applications in industrial designs. A highly cited researcher, who has published more than 350 technical papers, with eight best paper awards at international conferences and authored, co-authored and edited 5 books, the successful supervision of 45 PhD students and securing £25m in external research funding from UKRI and industry. He is an experienced academic leader, influential and visible in UK and international Higher Education, with contributions to engineering and industry recognised by the award of a CBE in the Queen's Honours 2018 and election as Fellow of the Royal Academy of Engineering in 2013. He has served on two of the UK research assessment framework (REF) exercises as a member of the Engineering panel, REF2014 and REF2021. He has contributed to numerous government research and education consultations through his active participation in the UK National Engineering Academy - the Royal Academy of Engineering (RAEng), where he is an elected member of the Trustee Board since 2021. He was elected to the Fellowship of the Royal Society in 2023.

Personal details

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Employment Summary

January 2023 - **Vice President (Research & Innovation)**
King's College London

- In October 2022, announced as the new Vice-President (Research & Innovation) from January 2023 with responsibility for developing and implementing the university's Research strategy and overseeing new research initiatives, whilst continuing to foster inter-faculty and multidisciplinary collaboration

April 2020 - **Executive Dean, Natural, Mathematical & Engineering Sciences**
King's College London

- Leading the Faculty of Natural, Mathematical & Engineering Sciences (NMES) with 5 departments (Chemistry, Physics, Mathematics, Engineering and Computer Science), providing long-term strategic initiatives with £100m College investment to build an outstanding science, engineering and technology capability faculty in the UK. This includes doubling the size of academic staff from 160 to 320 in a 5-year period and establishing three interdisciplinary research institutes in the Physical Science of Life, Net Zero and Food Science and Engineering

August 2018 - March 2020 **Executive Dean, Faculty of Engineering and Physical Sciences**
University of Southampton

March 2014 - July 2018 **Executive Dean, Faculty of Physical Sciences and Engineering**
University of Southampton

- Leading one of the largest faculties in the UK as Executive Dean with £250m of UKRI and industry funding and large-scale experimental facilities, developing a faculty interdisciplinary research strategy, including the establishment of four centres of excellence in the areas of digitalisation, sustainability and electrification and cultivating a culture of entrepreneurship, innovation and start-ups

August 2010 - March 2014 **Associate Dean (Research and Enterprise)**
Faculty of Physical Sciences and Engineering, University of Southampton

Sept 2005 - August 2008 **Deputy Head of School (Education)**
School of Electronics and Computer Science (ECS), University of Southampton

Arm Professor of Computer Engineering (2007)
School of Electronics and Computer Science (ECS), University of Southampton

Establishment of internationally leading research group in energy-efficient computing design and test, as demonstrated by securing £25m of funding from the EPSRC and industry. Appointed with a personal professorial chair in the School of Electronics and Computer Science at University of Southampton in 2004.

Prior, a principal lectureship was held in the School of Engineering and Technology at Staffordshire University from January 1997 to September 1999, working for 8 years beforehand in the electronic design industry with various international UK-based companies and in various design engineering roles.

Educational Qualifications

Date	Award Title	Subject	Awarding Body
1986 - 89	DPhil	Electronics Engineering	University of York, UK
1985 - 86	MSc	Electronics Engineering	University of Cardiff, UK
1980 - 84	BSc	Electrical and Electronics Engineering	University of Bath, UK

Major Honours and Distinctions

2023	Fellowship of the Royal Society
2023	Membership of the European Academy of Sciences and Arts - ordinary member in Class VI – Technical and Environmental Sciences
2020	UK Institute of Engineering and Technology (IET) Faraday Medal (the Institute’s highest honour and one of the most world’s most prestigious awards for engineers and scientists)
2018	Appointed Commander of the Order of the British Empire (CBE) by Her Majesty Queen Elizabeth II
2017 - 21	Research Excellence Framework (REF) panel member Engineering, UK government evaluation exercise
2015	Arm-Southampton Research Group of the Year Award, National Microelectronics Institute
2018	Arm-Southampton Research Group of the Year Award, Runner up, Techworks
2014 - 19	Royal Society Wolfson Fellowship for contributions to energy-efficient embedded computing
2012 - 14	REF panel member Electrical, Electronic and Materials
2013	Fellow of the Royal Academy of Engineering (UK National Academy)
2012-	Lifetime Fellow of the Design, Automation and Test in Europe (European Design and Automation Association EDAA) for major leadership and technical contributions, acting as General Chair of two of the largest and most influential conferences in his area of research, i.e. The European Test Symposium 2006 (UK) and the Design Automation and Test in Europe (DATE) in 2011 (France)
2012	IEEE / CEDA Outstanding Service Award for exceptional leadership, commitment and service to EDA community
2009	Fellow of the Institute of Electrical and Electronics Engineering (FIEEE)
2007	Arm Professor of Computer Engineering

2007	Fellow of the British Computer Society (FBCS)
2003	Fellow of the Institute of Engineering and Technology (FIET)
2003 to date	8 best paper awards and 6 best paper nominations at international conferences

Research Highlights

One of the world's leading academic researchers in energy-efficient computing as demonstrated as follows:

- Seminal contributions to the design and test of energy-efficient embedded computing, recognised particularly for initiating new directions for power-constrained testing and test data compression and dynamic voltage scaling for power management, leading to election as a Fellow of the Royal Academy of Engineering FREng (2013), Fellow of the IEEE (2009) and a Royal Society Wolfson Fellowship (2014). Research results adopted by several UK and international semiconductor companies, underpinned by publishing extensively with over 350 papers, 5 books and 5 book chapters. Google Scholar citation [here](#) indicates papers and books cited more than 10,000 times with an h-index of 55.
- Establishment of internationally leading research group in energy-efficient computing, electronics design and test over the last 16 years with significant industry and UK research council funding including EPSRC Platform Grant, Platform Grant renewal and Programme Grant. Such grants are awarded for research groups with outstanding impactful research outputs. See [here](#), [here](#) and [here](#)
- Establishment of the industry-academia Arm-Southampton research centre in 2008. The centre has been recognised as an exemplar in the UK for industry-academia collaboration. See [here](#). The centre has won the prestigious National Microelectronics Institute (NMI) Award for the University research group of the year (see [here](#)) and was recently was a runner-up in the prestigious TechWork collaboration award (see [here](#))
- Completion as Principal Investigator and Director of a research consortium, [PRiME](#), funded by the EPSRC (total value £5.6m), involving 4 universities and 5 industrial partners, which is held up as an exemplar of effective cross-disciplinary collaborative working by the EPSRC. See [here](#)
- Worked with other UK academics to produce a strategy for microelectronics design research in the UK. The strategy led the EPSRC to allocate £50m signposting in 2007 to support Grand Challenges in Microelectronic Design. Led the first grand challenge “Batteries Not Included” and subsequently led the preparation of a successful research proposal. Following this, as Principal Investigator and Director of a research consortium, [Holistic](#), funded by the EPSRC (total value >£1.5m and completing in October 2013)
- Supervised 45 PhD students to graduation, many working for high tech companies and universities

Recent Research Awards

2019 - 2022	EPSRC, Center for Spatial Computational Learning, £1.2m
2017 - 2022	EPSRC, Wearable and Autonomous Computing for Future Smart Cities, £1.5m
2014 - 2016	EPSRC, Highly-parallel algorithms and architectures for high-throughput wireless receivers, £480k
2013 - 2019	EPSRC, IRC 'SPHERE' – a Sensor Platform for Healthcare in a Residential Environment, £11.5m (£1.1m as Southampton PI)
2013 – 2017	EPSRC, Continuous On-line adaptation in Many- core Systems: From Graceful Degradation to Graceful Amelioration, £1.3m
2013 - 2019	EPSRC, PRiME: Power-efficient, Reliable, Many-core Embedded Systems, £5.6m
2013 - 2016	EPSRC, Resilient and Testable Energy-Efficient Digital Hardware, £449k
2012 – 2015	EPSRC, Channel Decoder Architectures for Energy-Constrained Wireless Communication Systems: Holistic Approach, £316k
2004 - 2021	Arm Cambridge, combined funding for Low Power Design and Arm-ECS Research

Centre, **£2.5m**

2010 - 2014 Erasmus Mundus, Master Course (2 year) in Embedded Computing Systems, **€920**
2010 - 2013 Artemis/EU, Person-centric Health Management, **€905**
2010 - 2013 EPSRC, Configurable Analog Transistor Array, **£442k**
2010 - 2013 EPSRC, Variation Aware Test, **£348k**
2009 - 2012 EPSRC, Next Generation Energy-harvesting Electronic Systems, **£722k**
2007 - 2011 EPSRC, Electronics Design Platform Grant Renewal, **£1m**
2006 - 2008 EPSRC, Reliable Low Power Embedded Computing, **£240k**
2006 - 2009 EPSRC, New Directions for Smart Sensors, **£416k**
2005 - 2008 EPSRC, Next Generation of Interconnection for MPSoC, **£260k**
2004 - 2008 EPSRC, System on Chip Methods and tools Platform Grant, **£431k**

Publication list: Professor Bashir M. Al-Hashimi CBE FREng FIEEE (September 2022)

BOOKS

1. Bashir M. Al-Hashimi (Editor), **System-on-Chip: Next Generation Electronics** (2006), IEE Press, Circuits and Systems Series, 944 pp, ISBN 0863415520. Best seller in Series (2007-09)
2. Marcus Schmitz, Bashir M. Al-Hashimi, Petru Eles, **System-Level Design Techniques for Energy-Efficient Embedded Systems** (2004), Kluwer Academic Publishers, 200 pp, ISBN 1402077505. *
3. Nicola Nicolici, Bashir M. Al-Hashimi, **Power Constrained Testing of VLSI Circuits** (2003), Kluwer Academic Publishers, Frontiers in Electronic Testing Series, 180 pp, ISBN 140207235. *
4. Bashir M. Al-Hashimi, **The Art of Spice Simulation** (1995), Analog and Digital, CRC Press, 248 pp, ISBN 08493-78958. Italian and Japanese translation 1997. Over 12000 copies have been sold world-wide.
5. Bashir M. Al-Hashimi, Geoff Merrett, (Editors), **Many-core computing: hardware and software**, IET publishers, June 2019, 568 pp, ISBN 9781785615825

BOOK CHAPTERS

1. Chapter on Design considerations for Reliable Embedded Systems, Shafik, Rishad Ahmed, Das, Anup K., Yang, Sheng, Merrett, Geoff V. and Al-Hashimi, Bashir (2014) In, Jonathan (ed.) **Reliability Characterisation of Electrical and Electronic Systems**. London, GB, Woodhead Publishing. (Woodhead Publishing Series in Electronic and Optical Materials 74). Swingler.
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3. Chapter on Testing Strategies for Multi-Voltage Designs, S. Khursheed, B Al-Hashimi, (2010) in Springer Science book **Power-Aware Testing and Test Strategies for Low Power Devices**, Girard, Xiaoqing, Nicolici (Editors).
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5. Chapter on Voltage-Selection for Time-Constrained Multiprocessor Systems on Chip, A. Andrei, P. Eles, Z. Peng, B. Al-Hashimi, in Springer book **Designing Embedded Processors: A Low Power Perspective**, J. Henkel, and S. Parameswaran, (Editor), 2007.
6. Chapter on Electronics System Simulation, Bashir Al-Hashimi, in CRC Press/IEEE Press book **The Electronics Systems Maintenance Handbook**, (Editor), 2001.

7. Chapter on Tools and Workloads, Walker, Matthew, James; Merrett, Geoff; Al-Hashimi, Bashir, Power modelling of multicore systems, **Many-Core Computing: Hardware and Software**. ed. / Bashir M. Al-Hashimi; Geoff Merrett , 2019.

JOURNAL PUBLICATIONS

1. Isuwa, S., Dey, S., Ortega, A. P., Singh, A. K., Al-Hashimi, B. M., & Merrett, G. V. (2022). QUAREM: Maximising QoE through Adaptive Resource Management in Mobile MPSoC Platforms. **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 21, Issue 4, Article No. 38pp 1–29
2. Sabet, A., Hare, J., Al-Hashimi, B. & Merrett, G. V. (2021) Similarity-aware CNN for Efficient Video Recognition at the Edge, (In press), **IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems**
3. Singh, A. K., Dey, S., Basireddy, K. R., McDonald-Maier, K., Merrett, G. V. & Al-Hashimi, B. M., (Oct 2020), Dynamic Energy and Thermal Management of Multi-Core Mobile Platforms: A Survey, **IEEE Design and Test**, 37, 5, p. 25-33 9 p., 9044742
4. Bantock, J. R. B., Al-Hashimi, B. M. & Merrett, G. V., (2020), Mitigating Interactive Performance Degradation from Mobile Device Thermal Throttling, (E-pub ahead of print), **IEEE Embedded Systems Letters**
5. Vasileios Tenentes; Shidhartha Das; Daniele Rossi; Bashir M. Al-Hashimi (2020) Run-time Protection of Multi-core Processors from Power-Noise Denial-of-Service Attacks, **IEEE Transactions on Device and Materials Reliability** On page(s): 0 Print ISSN: 1530-4388 Online ISSN: 1558-2574 Digital Object Identifier: 10.1109/TDMR.2020.2994272, 12.05.2020
6. Asieh Salehi Fathabadi, Mohammadsadegh Dalvandi, Michael Butler, Bashir M. Al-Hashimi (2019) Verifying Cross-layer Interactions through Formal Model-based Assertion Generation, **IEEE Embedded Systems Letters**, pp 1-1
7. Dynamic energy and thermal management of multi-core mobile platforms: a survey. / Singh, Amit Kumar; Dey, Somdip; Basireddy, Karunakar Reddy; McDonald-Maier, Klaus; Merrett, Geoff; Al-Hashimi, Bashir. In: **IEEE Design and Test**, 23.03.2020.
8. Energy-driven computing. / Sliper, Sivert T.; Cetinkaya, Oktay; Weddell, Alexander; Al-Hashimi, Bashir; Merrett, Geoff. In: **Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences**, Vol. 378, No. 2164, 20190158, 07.02.2020, p. 1-4
9. Collaborative adaptation for energy-efficient heterogeneous mobile SoCs. / Singh, Amit Kumar; Basireddy, Karunakar Reddy; Prakash, Alok; Merrett, Geoff; Al-Hashimi, Bashir. In: **IEEE Transactions on Computers**, Vol. 69, No. 2, 01.02.2020, p. 185-197
10. Xun, L., Tran-Thanh, L., Al-Hashimi, B. and Merrett, G. V. (2019) Incremental Training and Group Convolution Pruning for Runtime DNN Performance Scaling on Heterogeneous Embedded Platforms, (Published), **1st ACM/IEEE Workshop on Machine Learning for CAD (MLCAD 2019)**

11. AdaMD: Adaptive mapping and DVFS for energy-efficient heterogeneous multi-cores. / Basireddy, Karunakar R.; Singh, Amit Kumar; Al-Hashimi, Bashir; Merrett, Geoff V. In: ***IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems***, 13.08.2019
12. E. Weber Wachter, C. de Bellefroid, B. K. Reddy, A. K. Singh, B. Al-Hashimi, and G. Merrett (2019) Predictive Thermal Management for Energy-efficient Execution of Concurrent Applications on Heterogeneous Multi-cores, ***IEEE Transactions on Very Large Scale Integration Systems (TVLSI)***, (Accepted)
13. Domenico Balsamo, Benjamin J. Fletcher, Alex S. Weddell, Giorgos Karatziolas, Bashir M. Al-Hashimi, and Geoff V. Merrett (2018) Momentum: Power Neutral Performance Scaling with Intrinsic MPPT for Energy Harvesting Computing Systems, ***ACM Transactions on Embedded Computing Systems***, vol 1, 1, Article 1 pp. 1:1-1:25
14. Vala, C. K., French, M., Acharyya, A. & Al-Hashimi, B. (2018) Low-complexity architecture for cyber-physical systems model identification, ***IEEE Transactions on Circuits and Systems II: Express Briefs***, pp 1-6.
15. C K Vala, K Immadisetty, A Acharyya, C Leech, V Balagopal, G V. Merrett, Bashir M. Al-Hashimi (2018) High-Speed Low-Complexity Guided Image Filtering-Based Disparity Estimation, ***IEEE Transactions on Circuits and Systems I: Regular Papers***, Vol 65, Issue 2, pp. 606 – 617.
16. Salehi Fathabadi, A, Butler, M J, Yang, S, Maeda-Nunez, L, Bantock, J, Al-Hashimi, B M, Merrett, G V (2018) A model-based framework for software portability and verification in embedded power management systems, ***Journal of Systems Architecture***, 82, pp. 12-23.
17. B. K. Reddy, A. K. Singh, D. Biswas, G.V. Merrett, B. M. Al-Hashimi (2017) Inter-cluster thread-to-core mapping and DVFS on heterogeneous multi-cores, ***IEEE Transactions on Multi-Scale Computing Systems***, Vol 4, Issue 3, pp. 369-382.
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21. M. Walker, S. Diestelhorst, A. Hansson, A. Das, S. Yang, B. Al-Hashimi, G Merrett, (2017) Accurate and stable runtime power modeling for mobile and embedded CPUs, ***IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems***, 36,1, pp. 106-120, Best Paper nomination.
22. A. Singh, C. Leech, B. Reddy, B Al-Hashimi, G. Merrett, (2017) Learning-based Run-time Power and Energy Management of Multi/Many-core Systems: Current and Future Trends,

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