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Research Interests

Roger is a member of the AI Research Theme. His research interests includes:

Novel computing systems including multi-precision computing, edge computing solutions, Field Programmable Gate Arrays

Big Data analytics particularly focused at manufacturing.

Innovative telecommunications hardware platforms incorporating edge AI technology for advanced security and IoT applications.

Research output

A direct method to detect and localise damage using longitudinal data of ends-of-span rotations under live traffic loading
Ferguson, A., Hester, D. & Woods, R., 06 Nov 2021, (Early online date) In: *Journal of Civil Structural Health Monitoring*.

Efficient, Dynamic Multi-task Execution on FPGA-based Computing Systems

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Radio Frequency Fingerprint Identification for Narrowband Systems, Modelling and Classification

Zhang, J., Woods, R., Sandell, M., Valkama, M., Marshall, A. & Cavallaro, J., 10 Jun 2021, In: *IEEE Transactions on Information Forensics and Security*. 16, p. 3974-3987 13 p., 16.

Evaluation of Static Mapping for Dynamic Space-Shared Multi-task Processing on FPGAs

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TOD: Transprecise Object Detection to Maximise Real-Time Accuracy on the Edge

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Towards Improved Sensor Systems for Bridge Structural Health Monitoring

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Optimisation of System Throughput Exploiting Tasks Heterogeneity on Space Shared FPGAs

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Impact of Wireless Backhaul Unreliability and Imperfect Channel Estimation on Opportunistic NOMA

Lee, S., Duong, Q. & Woods, R., Nov 2019, In: *IEEE Transactions on Vehicular Technology*. 68, 11, p. 10822-10833 12 p.

A new data analytics framework emphasising preprocessing of data to generate insights into complex manufacturing systems

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Programmable Architectures for Histogram of Oriented Gradients Processing

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Work-in-Progress: Design Space Exploration of Multi-Task Processing on Space Shared FPGAs

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Opportunistic Non-Orthogonal Multiple Access Scheme with Unreliable Wireless Backhubs

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Knowles, S. C., Woods, R. F., McWhirter, J. G. & McCanny, J. V., 01 Jan 1988, *IEEE Computer Society Press, Intl. Conf. on Systolic Arrays*, eds. K Bromley, E S Swartzlander Jr and S Y Kung. p. 653-663 11 p.

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Projects

R1898ECI: Adaptive Hardware Systems with Novel Algorithmic Design and Guaranteed Resource Bounds

Woods, R.

01/08/2007 → ...

R1701ECI: CASE award: M.S. Mckeown- EPSRC/SELEX

Woods, R.

01/08/2005 → ...

R1848ELE: Dorothy Hodgkin Postgraduate Award

Woods, R.
01/08/2006 → ...

R1318ECI: eFUTURES XD

Woods, R.
01/08/2011 → 27/05/2015

R1057ECI: eFutures2 : exploiting the UK's rich heritage in electronics

Woods, R.
15/04/2019 → ...

R1337CSC: ENPOWER

Nikolopoulos, D. & Woods, R.
01/08/2013 → 05/02/2018

R1603ELE: EPSRC Case Ref 0430024 - Hasson

Woods, R.
01/08/2004 → ...

R1917CNR: Health Data Research UK (HDR UK)

Lawler, M., Blayney, J., Coleman, H., Dunne, P., Heaney, L., Kee, F., McArt, D., Nikolopoulos, D., O'Reilly, D., Overton, I., Salto-Tellez, M. & Woods, R.
29/10/2018 → ...

R1129ECI: Kelvin-2 - The High Performance Computing Centre in Northern Ireland (HPC-NI)

Woods, R., Chevallier, O., Gillan, C., Hu, P., Rafferty, K., Salto-Tellez, M., Tikhonova, I. & Vandierendonck, H.
04/12/2019 → ...

R2776LAW: Leverhulme Interdisciplinary Network on Algorithmic Solutions (LINAS)

Morison, J., Bourne, M., Degenhardt, T., MacCarthaigh, M., McCall, C., O'Kelly, C., Padmanabhan, D., Paternostro, M., Schwamb, M., Scott-Hayward, S., Smartt, S., Vandierendonck, H. & Woods, R.
17/03/2021 → ...

R6410CSC: NanoStreams: A Hardware and Software Stack for Real-Time Analytics on Fast Data Streams

Nikolopoulos, D., Spence, I. & Woods, R.
01/08/2013 → ...

R6551CSC: Open TransPREcision COMPuting

Woods, R., Karakonstantis, G. & Vandierendonck, H.
03/11/2016 → ...

R1138ECI: Programmable embedded platforms for remote and compute intensive image processing applications

Woods, R.
01/08/2012 → 31/07/2017

R1722CMM: Queen's University Belfast Imaging and Patterning Centre

Gregg, M., McNeill, D., Mitchell, N. & Woods, R.
20/02/2017 → 31/03/2018

R1728ELE: SHARES- System-on-chip heterogeneous architecture recognition engine for speech

Woods, R. & Ji, M.
01/08/2005 → ...

R1128CSC: Softcore Streaming Processors for FPGA DSP

McAllister, J. & Woods, R.
01/08/2009 → 28/02/2014

R1917ECI: Support for International Workshop on Applied Reconfigurable Computing in 2008

Woods, R.
01/08/2007 → ...

R1307ECI: WifiEar: A New Form of Telecoil

Woods, R. & Marshall, A.
01/08/2012 → ...

Awards

Activities

Dynamic Multi-task Execution on FPGA-based Computing Systems

Roger Woods (Advisor)
11 Dec 2020

Meeting The Challenges of an Ageing Society

Roger Woods (Advisor)
17 Feb 2020

Big Data conference

Roger Woods (Participant)
24 Oct 2019

15th International Symposium on Applied Reconfigurable Computing

Roger Woods (Conference committee co-chair)
01 May 2019

Big Data Week

Roger Woods (Chair)
18 Oct 2018

26th European Signal Processing Conference

Roger Woods (Member of programme committee)
03 Sep 2018 → 07 Sep 2018

International Conference on Field Programmable Logic and Applications

Roger Woods (Member of the organising committee)
27 Aug 2018 → 31 Aug 2018

UK Research and Innovation (External organisation)

Roger Woods (Advisor)
20 Aug 2018 → ...

IEEE International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation

Roger Woods (Member of programme committee)
15 Jul 2018 → 19 Jul 2018

14th International Symposium on Applied Reconfigurable Computing (Event)

Roger Woods (Board Member)

02 May 2018

Big Data conference

Roger Woods (Chair)

19 Oct 2017

Big Data Week

Roger Woods (Chair)

17 Oct 2017

IEEE International Workshop on Signal Processing Systems

Roger Woods (Member of programme committee)

03 Oct 2017 → 05 Oct 2017

FPL2017

Roger Woods (Member of programme committee)

04 Sep 2017 → 08 Sep 2017

17th International Conference on Embedded Computer Systems: Architectures, Modelling and Simulation

Roger Woods (Participant)

17 Jul 2017 → 20 Jul 2017

eFutures Annual Community Event

Roger Woods (Participant)

23 May 2017

International Symposium on Applied Reconfigurable Computing

Roger Woods (Member of programme committee)

03 Apr 2017 → 07 Apr 2017

IEEE Transactions on Very Large Scale Integration (VLSI) Systems (Journal)

Roger Woods (Peer reviewer)

14 Mar 2017

FPL2017

Roger Woods (Advisory board member)

2017

Key Generation from Wireless Channels

Roger Woods (Invited speaker), Alan Marshall (Invited speaker) & Junqing Zhang (Invited speaker)

08 Dec 2016

Key Generation from Wireless Channels

Roger Woods (Invited speaker)

04 Dec 2016 → 08 Dec 2016

IEEE International Workshop on Signal Processing Systems

Roger Woods (Member of programme committee)

26 Oct 2016 → 28 Oct 2016

International Conference on Field-Programmable Logic and Applications

Roger Woods (Member of programme committee)

29 Aug 2016 → 02 Sep 2016

16th International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation

Roger Woods (Member of programme committee)

17 Jul 2016 → 21 Jul 2016

16th International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation

Roger Woods (Member of programme committee)

17 Jul 2016 → 21 Jul 2016

Big Data Week

Roger Woods (Chair)

02 Jun 2016

Big Data conference

Roger Woods (Chair)

20 May 2016

International Conference on Field-Programmable Logic and Applications

Roger Woods (Advisory board member)

2016

IEEE International Workshop on Signal Processing Systems

Roger Woods (Member of programme committee)

14 Oct 2015 → 16 Oct 2015

International Conference on Field-Programmable Logic and Applications

Roger Woods (Member of programme committee)

02 Sep 2015 → 04 Sep 2015

IEEE International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation

Roger Woods (Member of programme committee)

20 Jul 2015 → 23 Jul 2015

FPGA-based acceleration of data applications

Roger Woods (Advisor)

11 May 2015

Big Data Conference

Roger Woods (Chair)

23 Apr 2015

48th Asilomar Conference on Signals, Systems and Computers

Roger Woods (Chair)

02 Nov 2014 → 05 Nov 2014

IEEE Workshop on Signal Processing Systems

Roger Woods (Member of the organising committee)

22 Oct 2014 → 24 Oct 2014

Entrepreneurship in practice in a university setting

Roger Woods (Advisor)

16 Oct 2014

WiPhyLoc8: VLSI Algorithms and Architectures for Positioning and Security in Wireless Communication Systems

Roger Woods (Advisor)

06 Oct 2014

Workshop on FPGA-based Implementation of Signal Processing Systems

Roger Woods (Participant)

23 Jun 2014 → 27 Jun 2014

Big Data Week

Roger Woods (Chair)

07 May 2014

Research Excellence Framework (REF) (External organisation)

Roger Woods (Member)

2014

IEEE International Conference on Embedded Computer Systems: Architectures, Modeling and Simulation

Roger Woods (Vice chair)

15 Jul 2013 → 18 Jul 2013

Engineering & Physical Sciences Research Council (External organisation)

Roger Woods (Chair)

29 May 2013

Engineering & Physical Sciences Research Council (External organisation)

Roger Woods (Member)

06 Feb 2013

Novel architectures and design tools for the implementation of complex DSP systems on FPGA-based technologies

Roger Woods (Speaker)

08 Nov 2012

IEEE Signal Processing Summer School

Roger Woods (Organiser)

20 Aug 2012 → 24 Aug 2014

Research Excellence Framework (REF) Panel (External organisation)

Roger Woods (Member)

01 Apr 2011 → 31 Dec 2014

International Workshop on Applied Reconfigurable Computing

Roger Woods (Chair)

23 Mar 2011 → 25 Mar 2011

Engineering Policy Group Northern Ireland (External organisation)

Roger Woods (Vice Chair)

2011 → ...

EPSRC Associate Peer Review College (External organisation)

Roger Woods (Member)

2011 → ...

eFutures (External organisation)

Roger Woods (Board Member)

2010 → ...

Microelectronics Design Grand Challenges: uGC1: Batteries Not Included

Roger Woods (Member)
23 Nov 2009

International Conference on Wireless Communications and Signal Processing, Nanjing, China

Roger Woods (Keynote/plenary speaker)
13 Nov 2009

17th European Signal Processing Conference (EUSIPCO-2009)

Roger Woods (Invited speaker)
27 Aug 2009

International Workshop on Applied Reconfigurable Computing

Roger Woods (Chair)
16 Mar 2009 → 18 Mar 2009

Analytics Engines Limited (External organisation)

Roger Woods (Board Member)
2007 → ...

IEEE Advisory board to the IEEE Signal Processing Society Technical Committee on the Design and Implementation of Signal Processing Systems (External organisation)

Roger Woods (Board Member)
2007 → ...

ACM Transactions on Reconfigurable Technology and Systems (Journal)

Roger Woods (Editorial board member)
2006

ACM Transactions on Reconfigurable Technology and Systems (Journal)

Roger Woods (Associate editor)
2005 → ...

EURASIP Journal on Signal Processing (Journal)

Roger Woods (Editorial board member)
2004 → 2007

Journal of VLSI signal processing systems for signal, image and video technology (Journal)

Roger Woods (Editorial board member)
2003 → ...

IET COMPUTERS AND DIGITAL TECHNIQUES (Journal)

Roger Woods (Associate editor)
2001 → ...

Press clippings

£1M Investment in Analytics Engines Ltd.

Roger Woods
26/02/2014
1 item of Media coverage

A conversation with Analytics Engines' and Queen's University's Roger Woods

Roger Woods

01/09/2017

1 Media contribution

Analytics Engines | Stephen McKeown | Invest NI Support

Roger Woods

08/05/2013

1 Media contribution

Announcement of Analytics Engines investment

Roger Woods

12/03/2014

1 item of Media coverage

Big Data conference is a Titanic success

Roger Woods

20/10/2017

1 Media contribution

Commercialisation of hearing research

Roger Woods

02/09/2014

1 item of Media coverage

Enterprise Ireland Academic Award at the Enterprise Ireland Student Entrepreneur Awards 2017

Roger Woods

08/06/2017

1 Media contribution

Hard Coding: The Benefits and Drawbacks of FPGAs

Roger Woods

27/01/2012

1 item of Media coverage

Publicity for launch of WPhyLoc8 US-Ireland grant

Roger Woods

28/11/2012 → 01/02/2013

3 items of Media coverage

Queen's University's Woods Says FPGAs Becoming More Accessible

Roger Woods

23/11/2012

1 item of Media coverage