

Malik Haddad
Research Fellow
School of Mechanical & Design Engineering
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Employment

Research Fellow

Research Fellow
School of Mechanical & Design Engineering
Faculty of Technology
Portsmouth, United Kingdom
29 Apr 2019 → present

Malik J. Haddad is a Research Fellow at the School of Mechanical and Design Engineering. He received a BSc in Electronic Engineering in 2006 from Princess Sumaya University for Technology. He went on to postgraduate study and was awarded a distinction in MSc in Electrical and Computer Engineering in 2007 from New York Institute of Technology, finally he completed a PhD in Decision Making applied to Management and Engineering in 2019 from the University of Portsmouth. Current research interests include decision making, especially multiple criteria decision making, assistive technologies, powered wheelchairs, obstacle avoidance, Machine Learning, Neural Networks, Artificial Intelligence, Intelligent Systems and Human Computer Interfaces. Dr Haddad is CEng MIET, PMP, MIEEE, MIMechE and a Fellow of the Jordan Engineers Association.

Qualifications

Ph.D.
25 Sep 2016 → 14 May 2019
Award Date: 14 May 2019
MSc, New York Institute of Technology
1 Sep 2006 → 21 Dec 2007
Award Date: 21 Dec 2007
BSc (Hons), Princess Sumaya University for Technology
1 Sep 2001 → 23 Jun 2006
Award Date: 23 Jun 2006

Employment

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Research outputs

Intelligent Assistive Sensors and Smart Systems for the Control and Analysis of Driver Reaction Times
Sanders, D., Haddad, M., Tewkesbury, G., Barker, T., Langner, M. & Gegov, A., 10 Sep 2021, *Advances in Intelligent Systems Research and Innovation*. Sgurev, V., Jotsov, V. & Kacprzyk, J. (eds.). Springer, (Studies in Systems, Decision and Control; vol. 379).

Facial recognition software for identification of powered wheelchair users

Tewkesbury, G., Lifton, S., Haddad, M., Sanders, D. & Gegov, A., 4 Aug 2021, *Intelligent Systems and Applications: Proceedings of the 2021 Intelligent Systems Conference (IntelliSys) Volume 1*. Arai, K. (ed.). Springer, p. 630-639 10 p. (Lecture Notes in Networks and Systems; vol. 294).

Intelligent control of a semi-autonomous Assistive Vehicle

Sanders, D., Tewkesbury, G., Haddad, M., Zouaoui, Z., Simandjuntak, S. & Vatchova, B., 4 Aug 2021, *Intelligent Systems and Applications: Proceedings of the 2021 Intelligent Systems Conference (IntelliSys) Volume 1*. Arai, K. (ed.). Springer, p. 613-621 9 p. (Lecture Notes in Networks and Systems; vol. 294).

Intelligent user interface to control a powered wheelchair using infrared sensors

Haddad, M., Sanders, D., Tewkesbury, G., Langner, M. C. & Simandjuntak, S., 4 Aug 2021, (Early online) *Proceedings of SAI Intelligent Systems Conference: IntelliSys 2021: Intelligent Systems and Applications*. Arai, K. (ed.). Springer, p. 640-649 10 p. (Lecture Notes in Networks and Systems; vol. 294).

One shot learning approach to identify drivers

Haddad, M., Sanders, D., Langner, M. C. & Tewkesbury, G., 4 Aug 2021, (Early online) *Proceedings of SAI Intelligent Systems Conference: IntelliSys 2021: Intelligent Systems and Applications*. Arai, K. (ed.). Springer, p. 622-629 8 p. (Lecture Notes in Networks and Systems; vol. 294).

Route optimization using forecasting, wheelchair modelling and path planning

Sanders, D., Tewkesbury, G., Haddad, M., Zouaoui, Z. & Simandjuntak, S., 24 Jun 2021, (Accepted for publication) *IEEE Proceedings of the International Conference on Intelligent Transportation Systems: Special Session Paper*. Institute of Electrical and Electronics Engineers

The effect of cryogenic machining of S2 glass fibre composite on the hole form and dimensional tolerances

Koklu, U., Morkavuk, S., Featherson, C., Haddad, M., Sanders, D., Aamir, M., Yurievich Pimenov, D. & Giasin, K., 3 May 2021, In: *International Journal of Advanced Manufacturing Technology*. p. 1-16 16 p.

Integrating statistical correlation with discrete multi-criteria decision making

Haddad, M., Sanders, D., Tewkesbury, G. & Bausch, N., 9 Mar 2021, In: *International Journal of Information and Decision Sciences*. 13, 1, p. 1-15 15 p.

Deep Learning architecture to assist with steering a powered wheelchair

Haddad, M. & Sanders, D., 1 Dec 2020, In: *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 28, 12, p. 2987-2994 7 p., 9225000.

A combined AHP-PROMETHEE approach for intelligent risk prediction of leak in a storage tank

Ikwan, F. C., Sanders, D. & Haddad, M., 18 Nov 2020, (Early online) In: *International Journal of Reliability, Risk & Safety*.

Analysis of reaction times and time-delays introduced into an intelligent HCI for a smart wheelchair

Sanders, D., Haddad, M., Tewkesbury, G., Bausch, N., Rogers, I. & Huang, Y., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. Sgurev, V., Jotsov, V., Kruse, R. & Hadjiski, M. (eds.). IEEE, p. 217-222 6 p. (IEEE IS Proceedings Series).

An intelligent monitoring system for a crude oil distillation column

Omoarebun, P. O., Sanders, D., Haddad, M., Hassan Sayed, M., Tewkesbury, G. & Giasin, K., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. IEEE, p. 159-164 (IEEE IS Proceedings Series).

Creation of a NFC reading system for university attendance monitoring with accessibility considerations for powered wheelchair users

Tewkesbury, G., Sanders, D., Haddad, M., Omoarebun, P. O., Gegov, A. & Chester, S., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. Sgurev, V., Jotsov, V., Kruse, R. & Hadjiski, M. (eds.). IEEE, p. 235-240 6 p. (IEEE IS Proceedings Series).

Initial results from using an intelligent system to analyse powered wheelchair users' data

Haddad, M., Sanders, D., Langner, M., Omoarebun, P. O., Thabet, M. & Gegov, A., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. Institute of Electrical and Electronics Engineers, p. 241-245 (IEEE IS Proceedings Series).

Intelligent energy management of compressed air systems

Thabet, M., Sanders, D., Becerra, V., Tewkesbury, G., Haddad, M. & Barker, T., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. IEEE, p. 153-158 (IEEE IS Proceedings Series).

Intelligent HMI and control for steering a powered wheelchair using a Raspberry Pi microcomputer

Haddad, M., Sanders, D., Ikwon, F. C., Thabet, M., Langner, M. C. & Gegov, A., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. IEEE, p. 223-228 (IEEE IS Proceedings Series).

Simple expert system for intelligent control and HCI for a wheelchair fitted with ultrasonic sensors

Sanders, D., Haddad, M., Tewkesbury, G., Thabet, M., Omoarebun, P. O. & Barker, T., 18 Sep 2020, *IEEE Proceedings of the Conference on Intelligent Systems (IS)*. Institute of Electrical and Electronics Engineers, p. 211-216 (IEEE IS Proceedings Series).

Steering direction for a powered-wheelchair using the Analytical Hierarchy Process

Haddad, M., Sanders, D., Langner, M., Ikwon, F. C., Tewkesbury, G. & Gegov, A., 18 Sep 2020, *2020 IEEE 10th International Conference on Intelligent Systems (IS)*. Institute of Electrical and Electronics Engineers, p. 229-234 (IEEE IS Proceedings Series).

Intelligent control and HCI for a powered wheelchair using a simple expert system and ultrasonic sensors

Sanders, D., Haddad, M., Omoarebun, P., Ikwon, F., Chiverton, J., Zhou, S., Rogers, I. & Vatchova, B., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 571-583 13 p. (Advances in Intelligent Systems and Computing; vol. 1252).

Intelligent control of the steering for a powered wheelchair using a microcomputer

Haddad, M., Sanders, D., Langner, M., Bausch, N., Thabet, M., Gegov, A., Tewkesbury, G. & Ikwon, F. C., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 594-603 (Advances in Intelligent Systems and Computing; vol. 1252).

Intelligent monitoring using hazard identification technique and multi-sensor data fusion for crude distillation column

Omoarebun, P. O., Sanders, D., Ikwon, F. C., Hassan Sayed, M., Haddad, M., Thabet, M., Piner, J. & Shah, A., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 730-741 (Advances in Intelligent Systems and Computing; vol. 1252).

Intelligent risk prediction of storage tank leakage using an Ishikawa Diagram with probability and impact analysis

Ikwon, F. C., Sanders, D., Haddad, M., Hassan Sayed, M., Omoarebun, P. O., Thabet, M., Tewkesbury, G. & Vuksanovic, B., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 604-616 (Advances in Intelligent Systems and Computing; vol. 1252).

Intelligent system to analyze data about powered wheelchair drivers

Haddad, M., Sanders, D., Langner, M., Thabet, M., Omoarebun, P. O., Gegov, A., Bausch, N. & Giasin, K., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 584-593 (Advances in Intelligent Systems and Computing; vol. 1252).

Introducing time-delays to analyze driver reaction times when using a powered wheelchair

Sanders, D., Haddad, M., Langner, M., Omoarebun, P., Chiverton, J., Hassan, M., Zhou, S. & Vatchova, B., 25 Aug 2020, *Intelligent Systems and Applications: IntelliSys Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 559-570 12 p. (Advances in Intelligent Systems and Computing; vol. 1252).

Management of compressed air to reduce energy consumption using intelligent systems

Thabet, M., Sanders, D., Haddad, M., Bausch, N., Tewkesbury, G., Becerra, V., Barker, T. & Piner, J., 25 Aug 2020, *Intelligent Systems and Applications: Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 206-217 (Advances in Intelligent Systems and Computing; vol. 1252).

Use of the Analytical Hierarchy Process to determine the steering direction for a powered-wheelchair

Haddad, M. J. M., Sanders, D., Thabet, M., Gegov, A., Ikwan, F. C., Omoarebun, P. O., Tewkesbury, G. & Hassan Sayed, M., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 617-630 (Advances in Intelligent Systems and Computing; vol. 1252).

Artificial Neural Network approach for business decision making applied to a corporate relocation problem

Haddad, M. & Sanders, D., 25 Jun 2020, In: *Archives of Business Research*. 8, 6, p. 180-195

Selecting a discrete multiple criteria decision making method for Boeing to rank four global market regions

Haddad, M., Sanders, D. & Tewkesbury, G., 1 Apr 2020, In: *Transportation Research Part A: Policy and Practice*. 134, p. 1-15 15 p.

Combining multiple criteria decision making with vector manipulation to decide on the direction for a powered wheelchair

Haddad, M. J. M., Sanders, D., Gegov, A., Hassan Sayed, M., Huang, Y. & Al-Mosawi, M., 24 Aug 2019, *Proceedings of SAI Intelligent Systems Conference: IntelliSys 2019: Intelligent Systems and Applications*. Bi, Y., Bhatia, R. & Kapoor, S. (eds.). Springer, p. 680-693 14 p. (Advances in Intelligent Systems and Computing; vol. 1037).

Indoor location and collision feedback for a powered wheelchair system using machine learning

Bausch, N., Shilling, P., Sanders, D., Haddad, M. J. M., Okonor, O. M. & Tewkesbury, G., 24 Aug 2019, *IntelliSys 2019 Intelligent Systems and Applications: Proceedings of the 2019 Intelligent Systems Conference*. Bi, Y., Bhatia, R. & Kapoor, S. (eds.). Springer, Vol. 1. p. 721-739 19 p. (Advances in Intelligent Systems and Computing; vol. 1037).

Initial results from using Preference Ranking Organization METHods for Enrichment of Evaluations to help steer a powered wheelchair

Haddad, M. J. M., Sanders, D., Tewkesbury, G., Gegov, A., Hassan Sayed, M. & Ikwan, F. C., 24 Aug 2019, *IntelliSys 2019 Intelligent Systems and Applications: Proceedings of the 2019 Intelligent Systems Conference*. Bi, Y., Bhatia, R. & Kapoor, S. (eds.). Springer, Vol. 1. p. 648-661 14 p. (Advances in Intelligent Systems and Computing; vol. 1037).

Intelligent approach to minimizing power consumption in a cloud-based system collecting sensor data and monitoring the status of powered wheelchairs

Okonor, O. M., Gegov, A., Adda, M., Sanders, D., Haddad, M. J. M. & Tewkesbury, G., 24 Aug 2019, *Proceedings of SAI Intelligent Systems Conference: IntelliSys 2019: Intelligent Systems and Applications*. Bi, Y., Bhatia, R. & Kapoor, S. (eds.). Springer, p. 694-710 17 p. (Advances in Intelligent Systems and Computing; vol. 1037).

Task programming methodology for powered wheelchairs

Tewkesbury, G., Sanders, D., Haddad, M. J. M., Bausch, N., Gegov, A. & Okonor, O. M., 24 Aug 2019, *IntelliSys 2019 Intelligent Systems and Applications: Proceedings of the 2019 Intelligent Systems Conference*. Bi, Y., Bhatia, R. & Kapoor, S. (eds.). Springer, Vol. 1. p. 711-720 10 p. (Advances in Intelligent Systems and Computing; vol. 1037).

Selecting a robust decision making method to evaluate employee performance

Haddad, M. J. M., Sanders, D. & Bausch, N., 14 Jun 2019, In: *International Journal of Management and Decision Making*. 18, 4, p. 333-351 19 p.

Selecting a discrete Multiple Criteria Decision Making method to decide on a corporate relocation

Haddad, M. J. M., Sanders, D. & Tewkesbury, G., 25 May 2019, In: *Archives of Business Research*. 7, 5, p. 48-67

Selecting a best compromise direction for a powered wheelchair using PROMETHEE

Haddad, M. J. M. & Sanders, D., 1 Feb 2019, In: *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 27, 2, p. 228-235 8 p.

A rule-based expert system to decide on direction and speed of a powered wheelchair

Sanders, D., Gegov, A., Haddad, M., Ikwan, F., Wiltshire, D. & Tan, Y. C., Jan 2019, *Intelligent Systems and Applications: Proceedings of the 2018 Intelligent Systems Conference (IntelliSys) Volume 1*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 822-838 17 p. (Advances in Intelligent Systems and Computing; vol. 868).

Learning to make intelligent decisions using an Expert System for the intelligent selection of either PROMETHEE II or the Analytical Hierarchy Process

Haddad, M., Sanders, D., Bausch, N., Tewkesbury, G., Gegov, A. & Hassan Sayed, M., Jan 2019, *Intelligent Systems and Applications: Proceedings of the 2018 Intelligent Systems Conference (IntelliSys) Volume 1*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 1303-1316 (Advances in Intelligent Systems and Computing; vol. 868).

Making decisions about saving energy in compressed air systems using Ambient Intelligence and Artificial Intelligence

Sanders, D., Robinson, D. C., Hassan Sayed, M., Haddad, M. J. M., Gegov, A. & Ahmed, N., Jan 2019, *Intelligent Systems and Applications: Proceedings of the 2018 Intelligent Systems Conference (IntelliSys) Volume 2*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 1229-1236 (Advances in Intelligent Systems and Computing; vol. 869).

Selection of discrete multiple criteria decision making methods in the presence of risk and uncertainty

Haddad, M. J. M. & Sanders, D., Nov 2018, In: *Operational Research Perspectives*. 5, p. 357-370 14 p.

A framework that uses sensitivity analysis to select multi criteria decision making methods

Haddad, M. J. M., 1 Dec 2017, In: *Journal of Computing in Systems and Engineering*. p. 413 - 419 7 p.

Recommending decision making methods for mobility problems

Haddad, M. J. M., 1 Nov 2017, In: *Journal of Intelligent Mobility*. p. 392 - 395 4 p.

Selection of a suitable MCDA method based on robustness of results and sensitivity analysis

Haddad, M. J. M., Sanders, D., Tewkesbury, G. & Bausch, N., 21 Sep 2017, p. 64. 1 p.

Algorithm to apply the best worst method to systems engineering problems concerning customer satisfaction, cost and implementation

Haddad, M. J. M., 27 Mar 2017, In: *Journal of Computing in Systems and Engineering*. p. 380-388 9 p.

Activities

Intelligent User Interface to Control a Powered Wheelchair using Infrared Sensors

Malik Haddad (Speaker)

3 Sep 2021

One Shot Learning Approach to Identify Drivers

Malik Haddad (Speaker)

3 Sep 2021

First workshop on how to improve mobility and quality of life for children with disabilities at the Intelligent Systems Conference

David Sanders (Organiser), Malik Haddad (Chair) & Giles Tewkesbury (Presented paper)

2 Sep 2021

Second workshop on how to improve mobility and quality of life for children with disabilities at the Intelligent Systems Conference

David Sanders (Organiser), Giles Tewkesbury (Chair) & Malik Haddad (Invited speaker)

2 Sep 2021

The second workshop on improving the mobility and quality of life for children with disabilities

Malik Haddad (Speaker)

2 Sep 2021

Chailey Heritage Foundation

Malik Haddad (Visiting researcher) & David Sanders (Visiting researcher)

28 Oct 2020

IEEE SAI Intelligent Systems Conference 2020

Malik Haddad (Presented paper)

4 Sep 2020

IEEE SAI Intelligent Systems Conference 2020

Malik Haddad (Presented paper)

3 Sep 2020

IEEE SAI Intelligent Systems Conference 2020

Malik Haddad (Presented paper)

3 Sep 2020

2020 IEEE 10th International Conference on Intelligent Systems

Malik Haddad (Chair)

31 Aug 2020

Participate in Intelligent Assistive Technology / Powered Wheelchair Workshop at IEEE 10th International Conference

Malik Haddad (Speaker)

29 Aug 2020

Paper presentation

Malik Haddad (Speaker)

28 Aug 2020

Paper presentation at IEEE 10th International Conference on Intelligent Systems 2020.

Malik Haddad (Speaker)

28 Aug 2020

Paper presentation at IEEE 10th International Conference on Intelligent Systems 2020.

Malik Haddad (Speaker)

28 Aug 2020

Speaker at Intelligent Assistive Technology / Powered Wheelchair Session

Malik Haddad (Speaker), David Sanders (Speaker), Giles Tewkesbury (Speaker), Martin Langner (Speaker) & Alexander Gegov (Speaker)

28 Aug 2020 → 30 Aug 2020

NATO ACT I3

Malik Haddad (Participant)

22 Feb 2020 → 1 Mar 2020

Chailey Heritage Foundation

Malik Haddad (Visiting researcher)

11 Jan 2020

Chailey Heritage Clinical Services

Malik Haddad (Visiting researcher)

12 Nov 2019 → 26 Nov 2019

IEEE SAI Intelligent Systems Conference 2019

Malik Haddad (Chair)
6 Sep 2019

IEEE SAI Intelligent Systems Conference 2019

Malik Haddad (Presented paper)
5 Sep 2019 → 6 Sep 2019

Chailey Heritage Clinical Services

Malik Haddad (Visiting researcher)
17 Jun 2019 → 21 Jun 2019

IEEE Sponsored SAI Intelligent Systems Conference 2018

Malik Haddad (Presented paper)
6 Sep 2018 → 7 Sep 2018

Euro Working Group on MCDA/M

Malik Haddad (Visiting researcher)
21 Jul 2018 → 4 Aug 2018

86th Meeting of Euro Working Group on MCDA

Malik Haddad (Participant)
21 Sep 2017 → 23 Sep 2017

Projects

Management and Business Decision Making

Haddad, M. & Sanders, D.
26/09/16 → 29/04/22

Using artificial intelligence to share control of a powered-wheelchair between a wheelchair user and an intelligent sensor system

Sanders, D., Gegov, A. & Haddad, M.
Engineering and Physical Sciences Research Council
1/11/18 → 1/11/22

Prizes

Award for Outstanding Innovation in Digital Health and Social Care

Sanders, David (Recipient), Tewkesbury, Giles (Recipient), Haddad, Malik (Recipient), Langner, Martin (Recipient) & Gegov, Alexander (Recipient), 19 Nov 2020

Best 1st Year PhD Student Paper

Haddad, Malik (Recipient), 2017

Best conference paper awarded at the IEEE Conference on Intelligent Systems.

Haddad, Malik (Recipient), Sanders, David (Recipient), Tewkesbury, Giles (Recipient), Bausch, Nils (Recipient), Rogers, I. (Recipient) & Huang, Ya (Recipient), 9 Sep 2020

Excellence in Creating a Smarter World International Innovation Award.

Sanders, David (Recipient), Haddad, Malik (Recipient), Tewkesbury, Giles (Recipient), Langner, M. (Recipient) & Gegov, Alexander (Recipient), 19 Nov 2020

