

# Curriculum Vitae of Prof. Dr. Hani Hagra

**Name:** Hani Hagra

## **Current Positions:**

- Professor of Artificial Intelligence, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom.
- Director of Impact and Knowledge Exchange, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom
- Head of the Artificial Intelligence Research Group, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom
- Director of the Computational Intelligence Centre, University of Essex, United Kingdom.
- Chief Science Officer, Temenos.

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## **Professional Experience**

- July 2021- Present: Director of Impact and Knowledge Exchange, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom.
- March 2021- Present: Head of the Artificial Intelligence Research Group, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom
- July 2019- Present: Chief Science Officer, Temenos (the World #1 Banking Software Company).
- July 2017- July 2021: Director of Research, School of Computer Science and Electronic Engineering, University of Essex, UK. **I led the School submission to REF 2021 which did see Essex coming 6th in UK for Research Power in Computer Science and Informatics**
- October 2015- July 2017: Director of Impact and Knowledge Exchange, School of Computer Science and Electronic Engineering, University of Essex, United Kingdom
- October 2009- July 2019: Chief Science Officer, Logicalglue Ltd.
- May 2007- Present: Director of the Computational Intelligence Centre, University of Essex, UK.

- June 2006- Present: Professor of Computer Science, School of Computer Science and Electronic Engineering, University of Essex, UK.
- June 2005-December 2017: Head of the Intelligent Environments Research Group, University of Essex, United Kingdom.
- August 2003-June 2006: Senior Lecturer (Associate Professor) in Computer Science, Department of Computer Science, University of Essex, UK
- January 2001-August 2003: Lecturer (Assistant Professor) in Computer Science, Department of Computer Science, University of Essex, UK.
- March 2000-January 2001: Lecturer in Computer Science (Assistant Professor), Department of Computer Science, University of Hull, UK.
- July 1994-October 1997: Senior Electronics and Control Engineer, the Swiss Engineering Company.
- October 1994-October 1997- Research Associate, Scientific Research and Technology Applications Academy.

## Education

- July 2000: Ph.D. in Computer Science (Robotics and Autonomous Systems), University of Essex, UK.
- November 1996: M.Sc. in Electrical Engineering (with specialization in Electronics and Communications Engineering), University of Alexandria, Egypt.
- June 1994: B.Sc. in Electrical Engineering (with specialization in Electronics and Communications Engineering), University of Alexandria, Egypt.

## Prizes and Awards

- ***Fellow IEEE (Institute of Electrical and Electronics Engineer) for contributions to Fuzzy Logic Systems.***
- ***Fellow IET (The Institution of Engineering and Technology)***
- ***Principal Fellow of the Higher Education Academy (HEA)***
- ***Fellow of the Artificial Intelligence Industry Alliance (AIIA).***
- ***Fellow AAIA (Asia-Pacific Artificial Intelligence Association)***

- ***Among the top 2% of the most-cited scientists in the world (Scopus August 2024)***
- ***Highly Ranked Scholar by ScholarGPS (my your scholarly contributions have placed me in the top 0.05% of all scholars worldwide)***
- ***IEEE Computational Intelligence Society (CIS) Distinguished Lecturer (2016-2018)***
- Awarded by the ***IEEE Computational Intelligence Society, the 2010 Outstanding Paper Award in the IEEE Transactions on Fuzzy Systems*** for my paper entitled “Towards General Type-2 Fuzzy Logic Systems based on zSlices,” by Christian Wagner and Hani Hagrass, *IEEE Transactions on Fuzzy Systems*, Vol. 18, pp. 637-660, August 2010. ***According to the Award Citation*** “This seminal paper allowed breakthroughs to the theory of handling the high levels of uncertainties present in real-world environment and applications”
- Awarded in cooperation with British Telecom (BT) ***the 2017 Global Telecoms Business Innovation Awards under the Business Service Innovation Category***. The award is for their joint project AI-R for service delivery which recognises our work in applying AI technologies and novel mixed reality systems for improving the deployment of engineering workforce to deliver service.
- ***Awarded the 2022 Outstanding Associate Editor Commendation from the IEEE Transactions of Fuzzy Systems.***
- ***Winner of the Best 2021 Knowledge Transfer partnership award***, awarded by the University of Essex.
- Awarded in cooperation with British Telecom (BT) ***the 2015 Global Telecoms Business Innovation Awards under the Business Service Innovation Category***. The award was for the project entitled “Work Area Optimization for Telecoms Engineers”. The iPatch manages the BT engineering workforce (more than 20,000 engineers) operations every day. Thus iPatch serves more than 96% of the UK Telecom and Internet networks as BT Open Reach manages the UK telecom infrastructure as well as EE mobile network. iPatch helped BT achieve its best public switched telephone network performance due to increasing the amount of work completed by engineers (productivity increase of 7%) by optimising the geographical areas to reduce the amount of time engineers spend travelling (travel was reduced by 3%). Furthermore, the iPatch reduced fuel costs and CO<sub>2</sub> emissions significantly (reduction of 2,500 metric tonnes of CO<sub>2</sub> annually). It also improved customer service by increasing task completion rates. This work also contributed to the Scottish Parliament debates on how Artificial Intelligence can lead to future prosperity. The iPatch was presented by BT to the Government Department for Business, Energy & Industrial Strategy as an input to UK R&D roadmap consultation for applied research.
- Awarded by the ***IEEE Computational Intelligence Society, the 2004 Outstanding Paper Award in the IEEE Transactions on Fuzzy Systems*** for my single authored paper entitled “A hierarchical type-2 fuzzy logic control architecture for autonomous mobile robots,” Vol. 12, No. 4, August 2004, pp. 524-539. The paper was published in 2004 and the award was bestowed in 2006. This paper is regarded as a pioneering paper in the field of intelligent control and according to the award citation the paper “introduced a novel and new type of controllers which can give excellent results and outperform other control mechanisms while being able to handle the various forms of uncertainties present in dynamic environments”. The paper has more than 1100 citations so far.
- Awarded the ***2018 best Knowledge Transfer Partnership Academic***, awarded by the University of Essex.

- Awarded by the University of Essex, **the 2017 best Research impact award for my work with British Telecom.**
- Awarded by the **IEEE Computational Intelligence Society (CIS)** the **2011 IEEE CIS Outstanding Chapter Award** for the IEEE CIS Egypt Chapter which I have founded and chaired in 2008-2010.
- **Awarded the Best Paper Award in the 36<sup>th</sup> International Conference of the BCS SGAI International Conference on Artificial Intelligence, Cambridge, December 2016 for our paper entitled “A Genetic Algorithm Based Approach for the Simultaneous Optimisation of Workforce Skill Sets and Team Allocation” by A. Starkey, H. Hagrass, S. Shakya, G. Owusu, Proceedings of the SGAI International Conference on Artificial Intelligence, Cambridge, December 2016.**
- **Awarded the Best Paper Award in the 2012 UK Workshop for Computational Intelligence, Edinburgh, UK, September 2012 for the paper entitled “A General Type-2 Fuzzy Logic Approach for Adaptive Modeling of Perceptions for Computing With Words” By A. Bilgin, H.Hagrass, A. Malibari, M. Alhaddad, D. Alghazzawi “**
- Awarded by the **Adjudication panel for the Institution of Engineering and Technology (IET) (Formerly known as the Institution of Electrical Engineers (IEE)) Knowledge Network Awards, the Technical & Professional Networks Award** for 2006/7.
- Acted as the Principal Investigator for a project which was **Awarded by the Technology Strategy Board, the 2011 UK Best Knowledge Transfer Partnership for London and the East Region.**
- Acted as the Principal Investigator for a project which was **Awarded the 2009 Lord Stafford Achievement in Innovation Award for East of England.** The award is given to a project which demonstrates the greatest potential for an innovative product or service that was developed between a University and company, where the product or service has been prototyped and is market ready. The project was done in a partnership between the University of Essex and IP4 Ltd. The project has developed a ground breaking intelligent data analysis and decision support system for Explainable AI. This afterwards developed to the start-up company Logicalglue ([www.logicalglue.com](http://www.logicalglue.com)), which led to a new product, the Explainable Artificial Intelligence Platform for financial applications (Logicalglue), acquired by Temenos (the number one banking software company in the World). This platform now helps people all over the world bringing explainability and transparency to the financial sector with one Billion end users in 150 countries and \$19 trillion in assets). Resulted in various granted and pending patents (such as USA patent 08515884, EU 2300965).
- **Best Student paper Award in the 2014 IEEE International Conference on Fuzzy Systems, Beijing, China, July 2014 within the 2014 IEEE World Congress on Computational Intelligence (WCCI 2014), Beijing, China, July 2014.**  
 Title: A Type-2 Fuzzy Logic Based System for Linguistic Summarization of Video Monitoring in Indoor Intelligent Environments  
 Authors: Bo Yao, Hani Hagrass, Daniyal Alghazzawi, Mohammed J. Alhaddad
- **Best Student paper Award in the 2006 IEEE International Conference on Fuzzy Systems, Vancouver, Canada, July 2006 within the 2006 IEEE World Congress on Computational Intelligence (WCCI 2006), Vancouver, Canada, July 2006.**  
 Title: Using Uncertainty Bounds in the Design of an Embedded Real-Time Type-2 Neuro-Fuzzy Speed Controller for Marine Diesel Engines

Authors: Christopher Lynch, Hani Hagra, Victor Callaghan

- ***Led a Research Students team to win the First place in the RoboCup 2010*** (The World most prestigious Intelligent Robotics Competition) (Festo Logistics League), Singapore, June 2010.
- ***Led a Research Students team to win Second place in the RoboCup 2009*** (The World most prestigious Intelligent Robotics Competition) (Festo Hockey League), Graz, Austria, June 2009.
- ***In 2007, I was Shortlisted by the Times Newspaper through the Times Higher Education supplement (THES) for the UK Young researcher of the year award and the only researcher nominated from the Computer Science and Engineering domain.***

## **Honours**

- Member of the ***IEEE Computational Intelligence Society CIS Fellows Sub-Committee (2025)***
- ***Member of the IEEE Standards Association working group for Explainable AI standard***
- Member of the ***IEEE Computational Intelligence Society CIS Fellows Sub-Committee (2023)***
- ***Chair of IEEE Computational Intelligence Society (CIS) Senior Members Sub-Committee. (2009)***
- ***Chair of the IEEE CIS Conference Bid subcommittee. (2021- 2022)***
- ***Chair of the IEEE CIS Task Force on Extensions to Type-1 Fuzzy Sets. (2006-2020)***
- ***Vice Chair of the IEEE CIS Technical Committee on Emergent Technologies (2009-2015).***
- ***Associate Editor for the Following Journals***
  - IEEE Transactions on Fuzzy Systems.
  - IEEE Transactions on Artificial Intelligence.
  - Knowledge Based Systems
  - Cognitive Computation.
  - The International Journal of Robotics and Automation.
  - Soft Computing.

- Journal of Ambient Computing and Intelligence
- Journal of Ambient Intelligence and Smart Environments.
- ***Invited to develop a tutorial for the IEEE Expert Now Online Tutorials entitled “Type-2 Fuzzy Logic Controllers: Towards a New Approach for Handling Uncertainties in Real World Environments” appeared January 2009.***
- ***Invited by the IEEE to join the IEEE-United Nations (UN) Humanitarian Technology Challenge project which is a partnership between the IEEE, the United Nations Foundation and the Vodafone Foundation. The project is targeted at developing technological solutions to some of the greatest challenges facing public health and disaster response workers today to help developing nations.***
- ***Member of the IEEE Computational Intelligence Society Fellows committee (2015)***
- ***Member of the IEEE Computational Intelligence Society Conference Committee (2019-2022)***
- ***Member of the IEEE Computational Intelligence Society Conference Strategic Planning Committee (2018- 2020)***
- ***Chair of the Communications subcommittee in the IEEE Computational Intelligence Society Conference Committee (2014-2017)***
- ***Chair of the of the Technical Conference Co-sponsorship sub committee in the IEEE Computational Intelligence Society (2016-2017)***
- ***Member of the IEEE CIS Fuzzy Systems Technical Committee (FSTC). (2006-Present)***
- ***Member of the IEEE Industrial Electronics Society (IES) IEEE IES Technical Committee of the Building Automation, Control and Management. (2004-2014)***
- ***Member of the IEEE CIS Emergent Technologies Technical Committee (ETTC). (2007-2016)***
- ***Member of the IEEE CIS Senior Members Sub Committee. (2008- 2010)***
- ***Member of the Executive Committee of the IET Robotics and Mechatronics Professional and Technical Network. (2005-2009)***
- ***Chair of the IEEE CIS Task Force on Intelligent Agents (2007-2008)***
- ***Member of the IEEE CIS Chapters Subcommittee. (2008)***

- ***Member of the validation committee of the Berufsakademie, Germany.***

## **1. Research Profile Statement**

My main research interests are in Explainable Artificial Intelligence (XAI) with applications to Cyber Physical Systems, Finance, Neuroscience, Life Sciences, Uncertainty Management, Intelligent Robotics and Intelligent Control of Industrial Processes.

***I have published over 500 papers in top International Journals, Books and Conferences. I have Eleven Industrial international granted patents and applications in the in the fields of XAI and Cyber Physical Systems.***

I have strong relations with industry and major companies which allows for the dissemination of my research to the commercial and industrial sectors thus resulting in real world products and services with strong impact on the wider society.

I served as the Director of Research for the School of Computer Science and Electronic Engineering where ***I led the School submission to REF 2021 which did see Essex coming 6th in UK for Research Power in Computer Science and Informatics.***

I maintain a sustained performance in winning external research funding where ***I was the principal investigator and co-investigator of many projects which received funding more than 20 Million Euros*** from the European Commission, the UK Department of Trade and Industry (DTI), UK Technology Strategy Board (TSB), UK Engineering and Physical Sciences Research Council (EPSRC), UK Economics and Social Sciences Research Council (ESRC), the Higher Education Funding Council for England (HEFCE), the German Federal Ministry of Education and Research (IB-BMBF), the Taiwan National Science Foundation, Korea-UK Science and Technology fund and many industrial companies including British Telecom, Leonardo, SUN microsystems, Hewlett-Packard (HP), Siemens, Intel, Kodak, MAN Ltd, Light wave Technologies Ltd, and other companies . I have acted also as a consultant for various companies including HSBC, British Telecom, Lightwave Technologies.

**I serve as the Chief Science Officer of Temenos which is the World #1 Banking Software Company**

I served as the General and Programme Chair of numerous major international conferences where I was the General co-Chair of the 2007 IEEE International Conference on Fuzzy Systems, London, UK, July 2007 and Programme Chair of the 2021 and 2017 IEEE International Conference on Fuzzy Systems, Luxembourg and Naples respectively and I served as the Programme Chair of the 2012 International Conference on Autonomous Intelligent Systems

(AIS), Aviero, Portugal, June 2012 and I served also as a co-chair of the 2011, 2013 and 2014, 2015, 2016, 2017 and 2018 IEEE International Symposium on Intelligent Agents in Paris, Singapore, Orlando, Cape Town, Santorini, Honolulu and Bangalore respectively. I was also the Programme Chair of the 2010 International conference of Intelligent Systems Design and Application, Cairo, Egypt, December 2010. In addition, I served as a member of the International Programme Committees of numerous major international conferences.

I served as an Associate Editor for the IEEE Transactions on Fuzzy Systems, IEEE Transactions on Artificial Intelligence, Knowledge Based Systems, Soft Computing, Cognitive Computation, the International Journal of Robotics and Automation and the Journal of Ambient Computing and Intelligence. I also serve as a reviewer for the EU, USA NSF, EPSRC, the Dutch research council, Portuguese Research council, Romanian Research Council, Czech Research council, the research council of Cyprus, the Singaporean Research council and the Taiwan Research Council.

I have been invited to deliver keynote speeches in numerous major international conferences.

**My research achievements are listed in the following sections**

## **1.1 Patents**

- In conjunction with Logicalglue, I have a USA (**Grant Number- 08515884**) and European patent (**Grant Number- 2300965**) entitled “***An improved Neuro Type-2 Fuzzy Logic Based method for decision making***”. This patent presented a novel system which is able to act on huge data sets and perform intelligent data analysis and provide intelligent decision making models that can be easily understood by humans and which are able to handle the inter and intra user uncertainties. The patent has already been applied in various domains including financial applications, cyber physical systems and medical applications to provide intelligent models that can predict and manage risk.
- I have a USA patent (**Grant Number- 10907838**) entitled “***Energy Efficient Cooker***”. The patent presented a cooker hotplate control system, to heat to and maintain a foodstuff at a preset temperature while minimizing energy consumption and maximizing the user safety and comfort for the cooking process.
- In conjunction with Lightwave Technologies, Ireland, we have an international patent entitled “***An Intelligent Fuzzy System to Optimise Energy Consumption***” number **PCT/EP2007/054323**. The patent presented a novel form of AI and Cyber Physical Systems

for intelligent buildings that is able to find the optimum set points within an intelligent building to save energy while maintaining the user comfort.

- In cooperation with British Telecom, we have **USA** (Grant Number- 10261833) **and European patent** (Grant Number- 3909206) entitled ***“Resilient Network Routing”***. The patent implemented method of determining non-intersecting primary and secondary routes between source and destination nodes in a communications network represented by a graph data structure of nodes and edges.
- In cooperation with British Telecom, we have an international patent entitled ***“An Optimisation Method for the Delivery of Series over Communications Networks” number PCT/GB2015/051644***. The invention provided a method which can be used to optimise the delivery of series over communications networks. Tasks which need to be executed within a short timescale and those which are not due to be executed for a long time are excluded from the optimisation process.
- ***“Event Detection and Summarisation” patent pending number PCT/GB2016/050863***. The patent presented a method and apparatus for determining behaviour of a plurality of candidate objects in a multi-candidate object scene. The method comprises the steps of frame-by-frame, extracting behaviour features from video data associated with a scene, providing the behaviour features to an input of a recognition module comprising and classifying candidate object behaviour for a plurality of candidate objects in a current frame.
- In cooperation with British Telecom, we have an international patent pending entitled ***“Interaction-Based Rendering of Spatial Environments” number PCT/EP2020/087120***. The patent implemented method of navigating a digital representation of a spatial environment by a user in which a portion of the digital representation is rendered by a rendering computer system for visualisation by the user, the method comprising: accessing a digital model of the environment including a specification of each of a plurality of virtual resources in the environment.
- In cooperation with Temenos, we have an international patent pending entitled ***“An Explainable Artificial Intelligence Mechanism” number PCT/GB2019/053045***. The patent presented a method for determining and explaining an artificial intelligence, AI, system employing an opaque model from a local or global point of view.
- In cooperation with British Telecom, we have an international patent pending entitled ***“Method and apparatus for retrieving a data package” number PCT/EP2018/061598***. This invention provides a method for ranking contextual data of a plurality of data packages in a

Knowledge Management System (KMS) as a computer system configured to store information on the maintenance of an apparatus, wherein each data package of the plurality of data packages includes a data part relating to maintenance of the apparatus.

- I have a British patent entitled “*Genetic-Fuzzy Real-Time Controller*” number “*GB2350695*”. The patented mechanism uses a double hierarchy of fuzzy-genetic systems enabling Genetic Algorithms to work in real time and converge to an adequate solution in a very short time. This mechanism had enabled the creation of a fast computing system that can find a control solution in an unstructured changing and dynamic environment. This technology autonomously operates and learns online, thereby reducing programming costs and enabling the adaptation to any user or environmental changes. This patent had enabled the control of problems that were regarded as challenging such the mobile robot autonomous navigation in outdoor environment, control of cement kilns and control of huge marine diesel engines. In addition, the patented mechanism has enabled the control of intelligent buildings to satisfy and react to the human and building changing objectives in a non intrusive way to create ambient intelligent environments.

## 1.2 Funded Projects

- (October 2025-October 2028), “Explainable Generative AI for Digital Communications auto scoring” by Funded by Innovate UK and Bowen Craggs Ltd, **(Principal Investigator)**. Our Essex funding is **£320,533**.
- (May 2025-May 2028), “Hybrid Information Fusion and Generative AI Approach for Legal Applications” by Funded by Innovate UK and WS Strategic Ltd, **(Principal Investigator)**. Our Essex funding is **£280,533**.
- (May 2020-May 2023), “Explainable AI system for Developing Novel AI techniques to Mobile Network Coverage” Funded by British Telecom, **(Principal Investigator)**. Our funding is **£260,000**.
- (June 2019-June 2022), “Explainable AI systems for high power pumping systems monitoring and predictive maintenance” Funded by Innovate UK and Aquatech Presmain Ltd, **(Principal Investigator)**. Our Essex funding is **£243,533**
- (March 2019-March 2022) “An Explainable Artificial Intelligence System for Realizing Smart Internet of Things Networks ” Funded by Innovate UK and Plextek Ltd, **(Principal Investigator)**. Our Essex funding is **£243,533**.

- May 2019-May 2022) “A Transparent Artificial Intelligence for remote surveying” Funded by Innovate UK and Above Surveying Ltd, (Co- Investigator). Our Essex funding is **£243,533**.
- (October 2018-October 2021) “*An Explainable AI paradigm for data Analysis*” Funded by Innovate UK and Cognitran Ltd, (**Co- Investigator**). Our Essex funding is **£243,533**.
- (March 2018-March 2021) “Visual classification & tagging, and delivering this ability into the hands of the domain experts.” Funded by the Technology Strategy Board and Filament Ltd, (**Principal Investigator**). The Essex funding is **£243,533**
- (October 2018-October 2021) “Strategic Deployment and Utilisation of Assets”, Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£75,000**
- (October 2018-October 2021) “Exploiting Mixed-Reality Technologies for Network Asset Management” Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£75,000**.
- (January 2017-January 2020) “Optimised Field Service Delivery: Exploiting computational approaches for field service delivery” Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£90,000**
- (October 2016-January 2019) “Risk-based simulation for sustainable field operations” Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£90,000**.
- (August 2015-August 2018) “An Intelligent Augmented Reality Remote Workforce Management System” Funded by the Innovate UK and BT. Funded by Innovate UK and British Telecom, (**Principal Investigator**). Our total Essex funding is **£222,000**.
- (August 2015-August 2018) “Enhanced Capability in Computer-Vision Based Decision-Making Systems” Funded by the Innovate UK and Selex ES (**Principal Investigator**). Our total Essex funding is **£210,000**.
- (October 2014- February 2017 )Advanced Resource Planning System for Organisational Design. Funded by British Telecom (**Principal Investigator**). The Essex funding was **£84,250**.
- (February 2014- February 2015) “*JUPITER & NEXT GENERATION FORECASTING MODELS*” Funded by British Telecom (**Principal Investigator**). The Essex funding was **£48,807**.
- (August 2014- December 2015) “Development of a hardware demonstration platform to monitor and detect human behaviours in a residential environment” Funded by Selex ES (**Principal Investigator**). The Essex funding was **£21,375**

- (October 2013- October 2014) “*Type-2 Fuzzy Logic Rule-based optimisation for operational supply planning*” Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£48,807**.
- (February 2013-January 2014) “*Rule Base Optimisation for Operational Supply Planning*”. Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£31,753**.
- (October 2011-October 2014) “*An Intelligent Type-2 Fuzzy Logic System for Schedule Adherence in BT*”. Funded by British Telecom. (**Principal Investigator**). Our Essex funding was **£84,250**.
- (September 2010- September 2013) “*Developing Intelligent Adaptive Systems for Process Control and Production Optimisation in the Oil Refining Industries*”.. Funded by the UK Technology Strategy Board and Sanctuary Personnel Ltd. (**Principal Investigator**). Our total Essex funding is **£197,266**.
- (December 2010-December 2013) “*Developing Fuzzy Logic Based Intelligent Data Integration and Visualisation Tools*”. Funded by the Technology Strategy Board and Sanctuary Personnel Ltd (**Principal Investigator**). Our total Essex funding is **£211,266**.
- (October 2010-October 2011) “*Distributed and Fuzzy Resource Planning*”. Funded by British Telecom. (**Principal Investigator**). The Essex funding was **£20,056**.
- (April 2011-April 2012) “*Optimised Production Fuzzy Planning Model*”. Funded by British Telecom (**Principal Investigator**). The Essex funding was **£26,660**.
- (January 2008-June 2011) “*Adaptive and Trusted Ambient Ecologies (ATRACO)*”. Funded by the European Commission Seventh Framework Programme (FP7). (**Principal Investigator**). The total funding for this project is **2 Million Euros** in which our funding is about **£542,782**. The project is in collaboration with the University of Ulm, Germany, LIMSI, France , CTI and InAccess Greece.
- (December 2010-December 2015), “*Scaling Intelligent Environments*” Funded by King Abdulaziz University, (**Co-Equal Investigator**). **Total Funding for Essex is £800,000**.
- (January 2011-January 2012): “*Realising Smart Intelligent virtual class within an intelligent home*”. Funded by the Higher Education Funding Council of England (HEFCE) (**Main Investigator**). The total funding of this project was **£110,000**.
- (December 2010- November 2011) “*Type-2 Fuzzy Ontology Model and Its Applications*” Funded by Taiwan National Science Council (NSC). Project number NSC 99-2911-I-024-

004 under the framework of the NSC Initiative for Research Cooperation among Top UK and Taiwan Universities. Total Funding **£60,000**. In Cooperation with National University of Tainan, Taiwan.

- (September 2010- September 2012): “*Evaluation of Fuzzy Control Algorithms in Wind Energy Conversion Systems*”. Project number STDF 599 (EGY-08-045). Funded by the International office of the German Federal Ministry of Education and Research (IB-BMBF) and the Egyptian Science and Technology Development Fund (STDF). (**Co-Equal Investigator**). The total funding of this project was **£200,000**. The project is in cooperation with Heilbronn University, Germany, Cairo University, Egypt.
- (September 2009- September 2010): “*Collaborative Distance Education within Intelligent Ambient Environments*”. Funded by Hewlett-Packard (HP). (**Co-Equal Investigator**). The total funding of this project was **£80,000**.
- (August 2009- August 2012) “*Type-2 Fuzzy Ontology based Intelligent Agent for Healthcare Application*” Project Number: NSC 98-2221-E-024 -009 -MY3. Funded by the Taiwan National Science Council. Total Fund is **£54,000** . In Cooperation with National University of Tainan, Taiwan
- (April 2006-October 2009) “*An Embedded Agent Based System to Create Ambient Intelligent Virtual Care Homes*”. Funded by the DTI, ESRC, Sanctuary Social Care. (**Principal Investigator**). Our total Essex funding is **£197,266**.
- August 2009: British Telecom Short Term Fellowship. Total Fund is £4000.
- (January 2008- July 2010) “*Ontology Based Intelligent Agent for CMMI Knowledge Management*” Project No. NSC 97-2221-E-024-011-MY2. Funded by the Taiwan National Science Council. **Total Fund is 320,000NTD**. In Cooperation with National University of Tainan, Taiwan and University of Salerno, Italy.
- (April 2008-April 2009): “*Realising An Intelligent Lecture Hall*”. Funded by the German University in Cairo, (**Principal Investigator**). The total funding of this project was **£40,000**.
- (January 2003-May 2006) “*Self-Organised Societies of Connectionist Intelligent Agents capable of Learning*”, Project No IST-2001-38911. Funded by the European Union (EU) Future and Emerging Technology programme. (**Principal Investigator**) . The total funding of this project is **1.8 million Euros** shared between 4 partners; University of Patras Medical

school (Greece), CTI (Greece), Tyndall National Institute (Ireland) and ourselves. Our Essex share is **£292,863**.

- (October 2002- October 2006) "*An Intelligent Embedded Agent for the speed Control of Marine Diesel Engines*" . Funded by MAN B&W Ltd. (**Principal Investigator**). The total Essex funding is **£56,000**. MAN is the biggest manufacturer of diesel engines in world and this project aims to develop intelligent agents that can be embedded in huge diesel engines to produce accurate and robust speed controllers for marine diesel engines.
- (April 2005- April 2007) "*Building an Intelligent Living Space (iSpace)*". Funded by the Higher Education Funding Council of England (HEFCE). (**Main Investigator**). The total funding of this development was **£400,000** where **250,000** were awarded for the equipment of the iSpace from the SRIF-3 initiative and about **£ 150,000** were awarded for the building structure from the SRIF-1 initiative.
- (January 2001- January 2004) "*eGadgets*", Project No IST200-25240. Funded by the EU Disappearing Computer programme. (**Principal-Investigator**). The total funding of this project was **1.2 million Euros** shared between 3 partners; CTI (Greece), NMRC (Ireland) and ourselves. Our Essex share was **£237,000**. The overall aim of the project was to create a computing framework for the design and implementation of future generations of pervasive computing artefacts.
- (October 2003- October 2005) "*Pervasive Home Environment Networks (PHEN)*" . Funded by the DTI New Wave Technologies and Markets Programme. (**Co-Investigator**). The total funding for this project is **£280,000** in which our Essex share is **£93,000**.
- (February 2001- February 2003) "*A soft-computing based, multi-agent architecture with applications to intelligent building sensing and control*". Funded by the Korea-UK Science and Technology Collaboration Fund. (**Principal Investigator**). Our total funding for the project was **£30,000**. This project was done in partnership with the Korean Advanced Institute of Science and Technology (KAIST).
- (June 2005- December 2005) " *Support for the IEE International workshop on Intelligent Environments*". Project No EP/C533607/1. Funded by the EPSRC. (**Principal Investigator**). The total Essex fund is **£11,000**.
- (March 2007-August 2007) "*Workshop on the Future of (UK) Fuzzy Systems Research*", Project No EP/E058388/1. Funded by EPSRC, total funding of £ 12,026. (**Co-investigator**)

### 1.3 Editorship of International Journals

- IEEE Transactions on Fuzzy Systems.
- IEEE Transaction on Artificial Intelligence
- Knowledge Based Systems
- The International Journal of Robotics and Automation.
- Soft Computing.
- Journal of Ambient Computing and Intelligence
- Cognitive Computation.
- Guest Editor of a Special Issue on “*Type-2 Fuzzy Logic Systems*” IEEE Computational Intelligence Magazine, December 2012.
- Guest Editor of a Special Issue on “*Advances of Intelligent Environments*” Journal of Pervasive and Mobile Computing, December 2009.
- Guest Editor of a Special Issue on “*Intelligence in Real Worlds*” Journal of Ubiquitous Computing and Intelligence, July 2006.
- Guest Editor of a Special Issue on “*Intelligent Embedded Agents*” in the Journal of Information Sciences, Vol. 171, issue 4, May 2005.
- Guest Editor of a Special Issue on “*Intelligent Learning and Control of Robotics*” in the Journal of Information Sciences, Vol. 140, Issue 3-4, May 2002.
- Guest Editor of a Special Issue on “*Computational Intelligence Techniques for Multi-robotics Systems*” in the International Journal of Robotics and Automation, Vol. 19, Number 7, January 2001.

### 1.4 Chairing of International Conferences

- Tutorial Chair of the 2023 IEEE International Conference on Fuzzy Systems, Incheon, South Korea, August 2023.
- Programme Chair of the 2021 IEEE International Conference on Fuzzy Systems, Luxembourg, July 2021.

- Technical Co-Chair of the 2020 IEEE International Conference on Fuzzy Systems held in conjunction with the 2020 IEEE World Congress on Computational Intelligence, Glasgow, UK, July 2020.
- General Co-Chair of the 2019 International Conference on Intelligent Computing in Data Science, Marrakesh, Morocco, October 2019.
- Programme Chair of the 2017 IEEE International Conference on Fuzzy Systems, Naples, Italy, July 2017.
- Co-Chair of the 2018 IEEE International Symposium on Intelligent Agents, Bangalore, India, December 2018.
- Co-Chair of the 2017 IEEE International Symposium on Intelligent Agents, Hawaii, USA, December 2017.
- Co-Chair of the 2016 IEEE International Symposium on Intelligent Agents, Santorini, Greece, December 2016.
- Co-Chair of the 2015 IEEE International Symposium on Intelligent Agents, Cape Town, South Africa, December 2015.
- Co-Chair of the 2014 IEEE International Symposium on Intelligent Agents, Orlando, USA, December 2014.
- Co-Chair of the 2013 IEEE International Symposium on Intelligent Agents, Singapore, April 2013.
- General Co-Chair of the 2007 IEEE International Conference on Fuzzy Systems, July 2007, London, UK.
- Co-Chair of the 2011 IEEE International Symposium on Advances in Type-2 Fuzzy Logic Systems, Paris, France, April 2011.
- Co-Chair of the 2011 IEEE International Symposium on Intelligent Agents, Paris, France, April 2011.
- Programme Chair of the 2012 International Conference on Intelligent Autonomous Systems, Aviero, Portugal, June 2012.
- Programme Chair of 2010 International Conference on Intelligent System Design and Applications (ISDA 2010), Cairo, Egypt, December 2010.
- Programme Co-Chair of the 2010 UK Workshop on Computational Intelligence (UKCI 2010), Colchester, UK, September 2010.
- Special Sessions Chair, 2011 IEEE International Conference on Fuzzy Systems, Taipei, Taiwan, July 2011.

- Programme Area Chair (Intelligent Agents and Smart Environments), 2011 IEEE International Conference on Fuzzy Systems, Taipei, Taiwan, July 2011.
- Tutorial Chair, 2016 IEEE International Conference on Fuzzy Systems within the 2016 IEEE World Congress on Computational Intelligence, Vancouver, Canada, July 2016.
- Tutorial Chair, 2013 IEEE International Conference on Fuzzy Systems, Hyderabad, India, July 2013.
- Programme Chair of the 2009 IEEE International Symposium on Intelligent Agents, Nashville, USA, April 2009.
- Programme Area Chair (control) for the 2009 IEEE International Conference on Fuzzy Systems, Jeju Island, Korea, August 2009.
- Programme Chair of the 2008 International Conference on Intelligent Environments, Seattle, USA, July 2008.
- Tutorial Chair of the 2016 IEEE World Congress on Computational Intelligence (WCCI 2016), Vancouver, Canada, July 2016.
- Technical Co-Chair of the 2014 IEEE International Conference on Fuzzy Systems, Beijing, China, July 2014.
- Poster Chair of 2009 International Conference on Ubiquitous Computing, Ubicomp 2009, Orlando, Florida, October 2009.
- Co-Chair of the 2013 IEEE International Symposium on Advances in Type-2 Fuzzy Logic Systems, Singapore, April 2013.
- Co-Chair of the 2013 IEEE International Symposium on Intelligent Agents, Singapore, April 2013.
- Programme Chair for the 2007 IET International conference on Intelligent Environments, September 2007, Ulm, Germany.
- Co-Chair of the organising committee for the 2006 International Symposium on Evolving Fuzzy Systems, September 2006, Lake District, UK.
- Programme Chair for the 2006 IET International conference on Intelligent Environments, July 2006, Athens, Greece.
- General Chair of the 2005 IEE International workshop on Intelligent Environments, 28-29 June 2005, Colchester, UK.
- Programme Co-Chair of the IASTED Robotics and Automation Conference, 23-25 August 2004 in Honolulu. Hawaii-USA.

- Publicity Chair of the 3<sup>rd</sup> International Conference on Ubiquitous Intelligence and Computing, Wuhan and Three Gorges China, September 2006.

## 1.5 Invited Speeches and Lectures

- Plenary Keynote speech in the **2024 Workshop on Explainable Artificial Intelligence for the Medical Domain – EXPLIMED**, held within the 27th European Conference on Artificial, Santiago de Compo Stella , Spain, October 2025.
- Plenary Keynote speech in the **2024 IEEE International Conference on ICT Solutions for eHealth, Paris, France, June 2024.**
- Plenary Keynote speech in the **2023 IEEE Symposium Series on Computational Intelligence, Mexico City, Mexico December 2023.**
- Invited Keynote speech in the **2023 International Joint Conference on Computational Intelligence, Rome, Italy, November 2023.**
- Invited Keynote speech in the **2022 UK Computational Intelligence Workshop, Sheffield UK, September 2022.**
- Invited Keynote speech in the **2021 IEEE-RIVF International Conference on Computing and Communication Technologies, Hanoi, Vietnam, December 2021.**
- Invited Keynote speech in the **2020 International Symposium on Computational Intelligence and Cybernetics, Chinese Academy of Science, December 2020.**
- Invited Keynote speech in the **2020 International Conference on Image Analysis and Recognition, ICIAR 2020, 24-26 June 2020, Portugal.**
- Invited Keynote speech in the **2019 International Conference on Intelligent Computing in Data Science, Marrakesh , Morocco, October 2019.**
- Invited Keynote speech in the **2018 International Conference on Intelligent Computing in Data Science, Fez, Morocco, October 2018.**
- Invited Keynote speech in the **Industry 4.0 conference within the 30<sup>th</sup> Anniversary of the Public University of Navarra, Spain, September 2017.**
- Plenary keynote speech within the **IEEE Computational Intelligence Society Distinguished Lecturer Programme in China (Chinese Academy of Science), September 2017**
- Plenary keynote speech within the **IEEE Computational Intelligence Society Distinguished Lecturer Programme in Canada (University of Ottawa), April 2018 .**

- Invited Keynote speech in the *Eleventh International Workshop on Fuzzy Logic and Applications, Naples, Italy, December 2016.*
- Invited Keynote speech in the *Computational Intelligence Summer School, Tunisia, November 2016.*
- Invited Keynote Speech in the *Intelligent Building Conference, Malta, May 2016 .*
- Invited Speech in the *2014 University of Granada, Spain Experts Seminar Series in Intelligent Systems, Granada, Spain, February 2014.*
- Invited Speech in *the 2013 Brazilian Congress on Computational Intelligence, Recife, Brazil, September 2013.*
- Invited Keynote Speech in *the 2008 IEEE International Conference on Fuzzy Systems within the IEEE World Congress on Computational Intelligence (WCCI 2008), Hong Kong, June 2008.*
- Invited to give a Plenary Keynote Speech in *the 2011 International Work-Conference On Artificial Neural Networks (IWANN 2011), Malaga, Spain, June 2011.*
- Invited to give a Plenary Keynote Speech in the *2011 International Conference on Adaptive and Intelligent Systems (ICAIS'11)", Klagenfurt, Austria, September 2011.*
- Invited to give a Plenary Keynote Speech in *the 9<sup>th</sup> International Conference on Intelligent Systems Design and Application, Pisa, Italy, December 2009.*
- Invited to give a keynote speech in the *International Conference on Digital Lifestyles and Systems, Tainan, Taiwan, June 2008.*
- Invited to give a keynote speech in the *2008 International Conference on Knowledge Engineering and Uncertainty handling, Ismailia, Egypt, July 2008.*
- Invited speech in the *workshop on Emergent Application of Computational Intelligence in Computer Go held within the 2010 IEEE World Congress on Computational Intelligence (WCCI 2010), Barcelona, Spain, July 2010.*
- Invited speech in the *2010 Workshop on Fuzzy Systems and Rough Sets, Cairo, Egypt, April 2010.*
- Invited to a Keynote speech in the *2006 International Symposium on Evolving Fuzzy Systems, Lake District, UK, September 2006.*
- Invited to give a Keynote speech in *the IEE Forum on Autonomous Systems, London, UK, November 2005.*
- *Invited to develop a tutorial for the IEEE Expert Now Online Tutorials entitled "Type-2 Fuzzy Logic Controllers: Towards a New Approach for Handling Uncertainties in Real World Environments"* appeared January 2009.

- Invited to give invited lectures in the ***National Centre for High Performance Computing, Taiwan, July 2010.***
- Invited to give invited lectures in the ***National University of Tainan, the National University of Kaohsiung, and the National Cheng Kung University, Taiwan, June 2008.***
- ***“ZSlices Based General Type-2 FLSs”, University of Navarra, Spain, December 2011.***
- ***“Type-2 FLCs: Towards a New Generation of Fuzzy Controllers”, Invited Lecture by Bogazici University, Istanbul, Turkey, October 2007.***
- ***“Intelligent Embedded Agents to create Ambient Intelligent Environments”. Invited Lectures by the Mobile and Pervasive Computing Laboratory, University of Florida, USA, April 2007.***
- ***“Intelligent Environments and Embedded Agents”, Invited Course at the University of Ulm, Germany, Funded by the EU Socrates Program, February 2006.***
- ***“Using Embedded Agents to Create Ambient Intelligence”, Invited talk by University of Lancaster, UK, November 2005.***
- ***“Towards developing embedded agents based on type-2 Fuzzy Logic” Invited talk by DeMontfort University, Leicester, UK, May 2004.***
- Invited paper entitled ***“Life Long Learning and Adaptation for Embedded agents operating in unstructured Environments”*** in the ***Joint 9<sup>th</sup> IFSA (the International Fuzzy Systems Association) World Congress and 20th NAFIPS (North American Fuzzy Information Processing Society) International Conference, Vancouver, Canada, July 25-28, 2001.***
- ***“A Hierarchical Fuzzy Genetic system for online learning and adaptation”, Invited talk by BT labs, BT Adastral Park, Martlesham Heath, UK, January 2000.***
- ***“An intelligent agricultural robot” invited lecture by the Czech Technical University, Prague, Czech Republic February 1999.***

## **1.6 Tutorial, Panels and Other Research Related Activities**

- Invited Panelist in the panel entitled ***“Explainable Artificial Intelligence”*** held within the ***2020 World Congress on Computational Intelligence, Glasgow, UK, July 2020.***
- Invited Panelist in the panel entitled ***“Computing with Words”*** held within the ***2013 IEEE International Conference on Fuzzy Systems, Hyderabad, India, July 2013.***
- Gave a tutorial entitled ***“Theoretical, Practical and Application Aspects of Type-2 Fuzzy Logic Systems”***, ***2012 IEEE International Conference on Fuzzy Systems, Brisbane, Australia, June 2012.***

- Gave a tutorial entitled “Practical and Application Aspects of Type-2 Fuzzy Logic Systems”, **2011 IEEE International Conference on Fuzzy Systems, Taipei, Taiwan, June 2011.**
- Gave a tutorial entitled “Theoretical and Practical Aspects of Type-2 Fuzzy Systems”, **2010 IEEE International Conference on Fuzzy Systems, Barcelona, Spain, July 2010.**
- *Invited to develop a tutorial for the IEEE Expert Now Online Tutorials entitled “Type-2 Fuzzy Logic Controllers: Towards a New Approach for Handling Uncertainties in Real World Environments”* appeared January 2009.
- Gave a tutorial entitled “Theoretical and Practical Aspects of Type-2 Fuzzy Systems”, **2009 IEEE International Conference on Fuzzy Systems, Jeju Island, Korea, August 2009.**
- Invited Panelist in the panel entitled “ Computing with Words ” held in the **2011 IEEE International Conference on Fuzzy Systems, Taipei, Taiwan, June 2011.**
- Invited Panelist in the panel entitled “ Human Vs Computer Go Competition ” held in the **2009 IEEE International Conference on Fuzzy Systems, Jeju Island, Korea, August 2009.**
- Panelist on the **Doctoral Colloquium of the 2009 International Conference on Ubiquitous Computing, Orlando, USA, September 2009.**
- Invited Panelist in the panel entitled “Type-2 Fuzzy Systems: Past, Present, Challenges and Future Directions” held in the **2008 IEEE International Conference on Fuzzy Systems, held within the 2008 World Congress on Computational Intelligence, Hong Kong, June 2008.**
- Organised a panel entitled “Fuzzy Logic Control: Challenges and New Directions”, **organized within the 2007 IEEE International Conference of Fuzzy Systems, London, UK, July 2007.**
- Organised and Chaired a Panel on “Intelligent Agents and Computational Intelligence” in the **2009 IEEE International Symposium on Intelligent Agents, Nashville, USA, April 2009.**
- Organising and chairing special sessions on “Intelligent Agents” in the 2008 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2008, Hong Kong, June 2008.
- Organising and chairing special sessions on “Advances in Type-2 Fuzzy Systems” in the 2008 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2008, Hong Kong, June 2008.
- Organised and chaired two special sessions on “*Theory and Applications of type-2 Fuzzy Logic*” in the 2006 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2006, Vancouver, Canada, July 2006.

- Organised and chaired two special sessions on “*Theory and Applications of type-2 Fuzzy Logic*” in the 2005 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2005, Reno, USA, May 2005.
- Organised and chaired two special sessions on “*Applications of type-2 Fuzzy Logic*” in the 2004 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE 2004, Budapest, Hungary, July 2004.
- Organised and chaired a special session on “*Co-operating Robotic Agents*” in the 32<sup>th</sup> International Symposium on Robotics and Automation, Seoul, Korea, 18-22 April 2001.
- Founding member and representative of the University of Essex in the European Robotics Research Network (EURON).
- **I have founded the series of the International conferences on Intelligent Environments (where I served as chair the steering committee of these conferences) which provided the first forum for different researchers from different disciplines to exchange ideas in the field which will help to break the boundaries between these disciplines thus strongly advancing the area.**
- Serving as a referee for the EU Research Council
- Serving as a referee for the UK Engineering and Physical Sciences Research Council (EPSRC)
- Serving as a referee for the Dutch Research Council.
- Serving as a referee for the Portuguese Research Council.
- Serving as a referee for the Czech Research Council.
- Serving as a referee for the Romanian Research Council.
- Serving as a referee for the USA National Science Foundation (NSF).
- Serving as a referee for the Romanian Research Council.
- Serving as a referee for the research council of Cyprus.
- Serving as a referee for the Singaporean Research council.
- Serving as a referee for the Taiwan Research Council.

## **1.7 Membership in the International Programme Committees of International Conferences**

**I have served as a member of the International Programme Committees of numerous major international conferences as follows:**

- Member of the International Programme Committee of the 2022 IEEE International Conference on Fuzzy Systems, Padua, Italy, July, 2022.
- Member of the International Programme Committee of the 2016 IEEE International Conference on Fuzzy Systems, Vancouver, Canada, July, 2016.
- Member of the International Programme Committee of the 2015 IEEE International Conference on Fuzzy Systems, Istanbul, Turkey, August, 2015.
- Member of the International Programme Committee of the 2014 IEEE International Conference on Fuzzy Systems, Beijing, China, July, 2014.
- Member of the International Programme Committee of the 2013 IEEE International Conference on Fuzzy Systems, Hyderabad, India, July, 2013.
- Member of the International Programme Committee of the 2013 UK Workshop on Computational Intelligence (UK CI 2013)
- Member of the International Programme Committee of the 2012 UK Workshop on Computational Intelligence (UK CI 2012)
- Member of the International Programme Committee of the 2011 IEEE International Conference on Fuzzy Systems, Taiwan, Taipei, June, 2011.
- Member of the International Programme Committee of the 2011 International Symposium on Ubiquitous Computing and Ambient Intelligence (UCAmI'11) Riviera Maya, Mexico, December 2011.
- Member of the International Programme Committee of the 2011 International Conference on Intelligent Environments, Nottingham, UK, July 2011.
- Member of the International Programme Committee of the 2011 International Conference on Informatics in Control, Automation and Robotics, Leeuwenhorst, Netherland, July 2011.
- Member of the International Programme Committee of the 2011 International Conference on Adaptive and Intelligent Systems (ICAIS), Klagenfurt, Austria, September 2011.
- Member of the International Programme Committee of the 2011 the International Conference on Smart Homes and Health Telematics (ICOST2011), Montreal, Quebec, Canada, June 2011.
- Member of the International Programme Committee of the 2010 IEEE International Conference on High Performance Computing and Communications, Melbourne, Australia, September 2010.

- Member (of the International Programme Committee of the 2010 International Conference on Natural Computation ICNC'10) and the 2010 International Conference on Fuzzy Systems and Knowledge Discovery , August 2010, Yantai, China.
- Member (of the International Programme Committee of the 2010 International Conference On Smart homes and health Telematics (ICOST 2010), Seoul, Korea, June 2010.
- Member (of the International Programme Committee of the 2010 International Conference on Computational Intelligence, Robotics and Autonomous Systems (CIRAS 2010) September 2010, Bangalore, India.
- Member of the International Programme Committee of the 2010 International Conference on Autonomous and Intelligent Systems, June 2010, Povia de Varzim, Portugal.
- Member of the International Programme Committee of the 2010 International Symposium on Ambient Intelligence, Guimarães, Portugal, June 2010.
- Member of the International Programme Committee of the 2009 IEEE International Conference on Fuzzy Systems, Jeju Island, Korea. August 2009.
- Member of the International Programme Committee of the 2009 IEEE/WCI/ACM International Conferences on Web Intelligence (WI'09) and Intelligent Agent Technology (IAT'09), Milan, Italy, September 2009.
- Member of the International Programme Committee of the 7th International Conference On Smart homes and health Telematics (ICOST2009), Tours, France, July 2009.
- Member of the International Programme Committee of the 8th International Conference on Pervasive Intelligence and Computing (PICom 2009) at Chengdu, China ,2009.
- Member of the International Programme Committee of the 23<sup>rd</sup> International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems IEA-AIE 2010, June 2010.
- Member of the International Programme Committee of the 4th International Workshop on Genetic and Evolutionary Fuzzy Systems, March 2010, Mieres, Spain.
- Member of the International Programme Committee of the IASTED International Conference on Robotics, Telematics and Applications, Beijing, China, October 2009.
- Member of the International Programme Committee of the International Conference on Soft Computing and Pattern Recognition, Malacca, Malaysia, December 2009.

- Member of the International Programme Committee of the International Programme Committee of the 6th International Conference on Informatics in Control, Automation and Robotics (ICINCO), Milan, Italy, July 2009.
- Member of the International Programme Committee of the 2009 International Conference on Agents and Artificial Intelligence, 2009.
- Member of the International Programme Committee of the 2009 World Congress on Nature and Biologically Inspired Computing (NABIC'09), Coimbatore, India, December 2009.
- Member of the International Programme Committee of the 7th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing (EUC-09), Vancouver, Canada, August 2009.
- Member of the International Programme Committee of the 2009 UK Workshop on Computational Intelligence (UK CI 2009), Nottingham, UK, September 2009.
- Member of the International Programme Committee of the fifth International Symposium on Ubiquitous Computing Systems, Beijing, China, August 2009.
- Member of the International Programme Committee of the International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE-2009), Taiwan, September 2009.
- Member of the International Programme Committee of the 2009 Global Congress on Intelligent Systems (GCIS 2009), Xiamen, China, May 2009.
- Member of the International Programme Committee of the 2009 International Conference on Adaptive and Intelligent Systems (ICAIS'09), Austria. September 2009.
- Member of the International Programme Committee for the 2008 IEEE International Conference on Fuzzy Systems, Hong Kong, June 2008.
- Member of the International Programme Committee for the 5th International Conference on Informatics in Control, Automation and Robotics (ICINCO), Madeira, Portugal. May 2008.
- Member of the International Programme Committee for the Fifth IEEE International Symposium on Embedded Computing (SEC 2008), Beijing, China, October 2008.
- Member of the International Programme Committee for the 2008 International Conference on Embedded Software and Systems, Chengdu, Sichuan, China, July 2008.
- Member of the International Programme Committee for the 3rd International Workshop on Genetic and Evolving Fuzzy Systems, 4 - 7 March, 2008, Witten-Bommerholz, Germany.
- Member of the International Programme Committee for the 2008 UK Workshop on Computational Intelligence, De Montfort University, Leicester, September 2008.

- Member of the International Programme Committee for the 11th Mechatronics Forum International Conference on Mechatronics, Limerick, Ireland 23-25 June 2008
- Member of the International Programme Committee for the 2008 International Conference on Advances in Computer-Human Interactions, February 2008 - St. Luce, Martinique
- Member of the International Programme Committee for the 4<sup>th</sup> IEEE Tutorial and Research Workshop on Perception and Interactive Technologies for Speech-Based Systems, June 16-18 2008, Kloster Irsee, Germany
- Member of the International Programme Committee for the 2007 IEEE International Conference on Fuzzy Systems, London, UK, July 2007.
- Member of the International Programme Committee for 2007 IEEE International Conference on Industrial Informatics Vienna, Austria, July 2007.
- Member of the International Programme Committee for the 2007 International Fuzzy Systems Association World Congress, Cancun, Mexico, June 2007.
- Member of the International Programme Committee for the 2007 International Symposium on Ubiquitous Computing Systems, Tokyo, Japan, November 2007.
- Member of the International Programme Committee for the 2007 International Workshop on Managing Ubiquitous Communications and Services, Munich, Germany, May 2007.
- Member of the International Programme Committee for the 2007 International Conference on Informatics in Control, Automation and Robotics (ICINCO 2007), Angers, France, May 2007.
- Member of the International Programme Committee for 2007 International Symposium on Ubiquitous Computing & Ambient Intelligence (UCAmI'07), Zaragoza, Spain, September 2007.
- Member of the International Programme Committee for the 12<sup>th</sup> Online World Conference on Soft Computing in Industrial Applications (WSC12), Bristol, UK, October 2007.
- Member of the International Programme Committee for the 2007 IEEE International Workshop on Smart Homes for Tele-Health, Niagara Falls, Canada, May 2007.
- Member of the International Programme Committee for the 2007 International Workshop on Ambient Intelligence, Media, and Sensing, Istanbul, Turkey, April 2007
- Member of the International Programme Committee for the 3<sup>rd</sup> International Conference on Ubiquitous Intelligence and Computing (UIC 2006), Wuhan, China, September 2006
- Member of the International Programme Committee for the 2006 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE, Vancouver, Canada, 16-21 July 2006.

- Member of the International Programme Committee for the IEEE 20<sup>th</sup> International Conference on Advanced Information Networking and Applications, 18-20 April 2006, Vienna, Austria.
- Member of the International Programme Committee for the 32<sup>nd</sup> International Conference of the IEEE Industrial Electronics Society, Paris, France, 7-10 November, 2006
- Member of the International Programme Committee for the 2005 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE, Reno, USA, 22-25 May 2005.
- Member of the International Programme Committee for the 11th World Conference on Soft Computing in Industrial Applications (WSC11), Georgia Institute of Technology, USA, October 2006.
- Member of the International Programme Committee for the International Joint Conferences on Computer, Information and Systems Sciences and Engineering, Bridgeport, USA, October 2006.
- Member of the International Programme Committee for the 2<sup>nd</sup> International Symposium on Evolving Fuzzy Systems, 7-9 September 2006, Ambleside, UK.
- Member of the International Programme Committee for the 2006 International Conference on Ubiquitous Intelligence and Computing (UIC 2006), Wuhan, China, September 2006
- Member of the International Programme Committee for 3<sup>rd</sup> International Conference on Informatics in Control, Automation and Robotics (ICINCO 2006), 1-5 August 2006, Setubal, Portugal.
- Member of the International Programme Committee for the 2006 IFIP International Conference on Embedded and Ubiquitous Computing (EUC'2006), 1-4 August 2006, Seoul, Korea.
- Member of the International Programme Committee for the 2006 World Automation Conference in Budapest, Hungary, 24-27 July 2006.
- Member of the International Programme Committee for the 6<sup>th</sup> International Conference on Recent Advances in Soft Computing (RASC 2006), Canterbury, UK, 10-12 July 2006
- Member of the International Programme Committee 2006 International Workshop on Managing Ubiquitous Communications and Services, 4-5 May 2006, Cork, Ireland
- Member of the International Programme Committee of the International Symposium on Intelligent Environments, Cambridge, UK, 5-7 April 2006.

- Member of the International Programme Committee for the 2005 IFIP International Conference on Embedded and Ubiquitous Computing (EUC'2005), 6-9 December 2005, Nagasaki, Japan.
- Member of the International Programme Committee for 2<sup>nd</sup> International Conference on Informatics in Control, Automation and Robotics (ICINCO 2005), 14-17 September 2005, Barcelona, Spain.
- Member of the International Programme Committee for the 10th World Conference on Soft Computing in Industrial Applications (WSC10), University of Cranfield, UK, October 2005.
- Member of the International Programme Committee for the International Symposium on Genetic Fuzzy Systems, Granada, Spain, 17-19 March 2005.
- Member of the International Programme Committee for the International Joint Conferences on Computer, Information and Systems Sciences and Engineering, Bridgeport, USA, 10-20 December 2005
- Member of the International Programme Committee for the 2004 IEEE International Conference on Fuzzy Systems, FUZZ-IEEE, Budapest, Hungary, July 2004.
- Member of the International Programme Committee for the 2004 World Automation Conference, Seville, Spain, July 2004.
- Member of the International Programme Committee for the 5<sup>th</sup> International Conference on Recent Advances on Computing, Nottingham, UK, December, 2004.
- Member of the International Programme Committee for the 9<sup>th</sup> World Conference on Soft Computing in Industrial Applications (WSC9), Chung-Ang University, Korea, October 2004
- Member of the International Programme Committee for the 13<sup>th</sup> International Conference on Genetic and Evolutionary Computation (GECCO-2004), Seattle, USA, June 2004.
- Member of the International Programme Committee for the 8<sup>th</sup> World Conference on Soft Computing in Industrial Applications (WSC8), University of Dortmund, Germany, October 2003.
- Member of the International Programme Committee for the 12<sup>th</sup> International Conference on Genetic and Evolutionary Computation (GECCO-2003), Chicago, USA, July 2003.
- Member of the International Programme Committee for the 4<sup>th</sup> International Conference on Recent Advances on Computing, Nottingham, UK, December, 2002

- Member of the International Programme committee for ISORA 2002 conference (9<sup>th</sup> International Symposium on Robotics and Applications) in the World Automation Conference in Orlando, Florida, on June 9-13, 2002.
- Member of the International Programme committee for the 6<sup>th</sup> International Conference on Computer Science and Informatics (CS&I'2002), March 8-14, 2002, Durham, NC, USA
- Member of the International Programme Committee of the International Conference on Industrial Electronics Technology and Automation (IETA 2001), Cairo, Egypt 19-21 December 2001.

## 1.8 Development of Research Infrastructure

- I played a major role in the construction and design of the Essex intelligent Classroom (iClass) which is a world class test bed for research in intelligent environment and ambient intelligence in learning and education.
- I played a major role in the construction and design of the intelligent Space (iSpace) which is a world class test bed for research in intelligent environment and ambient intelligence. The iSpace is built as a self-contained flat incorporating a lounge/kitchen/dining area, two bedrooms and a 'wet' bathroom. Included in the design of the iSpace was the provision of accessible wall cavities and ceiling spaces enabling the embedded intelligence to be 'hidden' from the occupants of the flat. This allows the internal appearance of the flat to remain normal enabling user evaluations to be performed in an unbiased environment.
- I played a major role in the construction and design of the intelligent Dormitory (iDorm) which is a cutting edge test-facility for intelligent environments and ambient intelligence. The iDorm set up has been visited by the Her Royal Highness the Queen during her visit to Essex in November 2005. The iDorm is based on a student study bedroom which has been fitted with a liberal set of networked based embedded-computers, sensors and effectors that can be arranged into almost endless pervasive computing experimental arrangements (see <http://iieg.essex.ac.uk/idorm.htm> for more information). The iDorm has been featured in many TV broadcasts including the BBC1's *Tomorrow's World*, BBC2's *Matter of Fact*, the BBC Look East News and Anglia TV as well as many Radio interviews in various radio stations including BBC Radio, SGR Colchester and others. The iDorm has also produced various press releases in the Times and various other magazines and news papers.

- Established the Intelligent Classroom and the Ambient Intelligence Centre in the German University in Cairo.
- Established the Robotics labs and the Robotics research group in the German University in Cairo

## **1.9 PhD Examiner Duties**

- I have performed various PhD external examining duties, where most recently I acted as a PhD external examiner for:
  - LMSI, France
  - University of Milan, Italy
  - University of Granada, Spain
  - Public University of Navarra, Spain
  - University of Sheffield, UK
  - University of Edinburgh, UK
  - University of Nottingham, UK
  - University of Lancaster, UK
  - University of Leicester, UK
  - DeMontfort University, UK
  - University of Otago, New Zealand
  - National University of Singapore, Singapore.
  - Ain Shams University, Egypt
  - Nottingham Trent University, UK.
  - Cairo University, Egypt
- Msc External Examiner for DeMontfort University, UK (October 2011-October 2015)

## **1.10 Research Students Supervision**

### **Previous PhD and Research Students**

- Dr. Faiyaz Doctor
- Dr. Christopher Lynch
- Dr. Christian Wagner
- Dr. Hakan Duman
- Dr. Elias Tawil
- Dr. Fernando Illing-Worth
- Dr. James Dooley
- Dr. Nazanin Sahab
- Dr. Nur Syibrah Muhamad Naim
- Dr. Ahmed Mohamed
- Dr. Dario Bernardo
- Dr. Aysenur Bilgin
- Dr Bo Yao
- Dr Khaled Al Mohammadi
- Dr Andrew Starkey
- Dr. Sherief Mowafey
- Dr Song Wei
- Dr Emmanuel Ferreyra
- Dr Ravikieran Chimatapu
- Dr Jareth Wolfe
- Dr Lewis Veryard
- Dr Mehrin Kiani
- Dr Hala Saleh

- Dr Ahmed Saleh
- Bahaa El Desoky
- Sarah El Kasrawy
- Mina Zaher
- Amr El Faham
- Mohamed El Mehdar
- Ahmed Abdelaziz
- Summer Kassem
- Liam Beasley
- Hugo Leon-Garca
- Belay Chekol
- Heba Ahmed
- Maha Salah

I am currently supervising the following **PhD** and Research students

- Khizra Maqsood
- Saed Khalil
- Ashish Bhatia
- Mahmoud Al Fayan

## **Publications**

### ***Journals Papers***

- Y Ghozzi, TM Hamdani, H Hagra, K Ouahada, H Chabchoub, AM Alimi, "A deep learning based interval type-2 fuzzy approach for image retrieval systems", **Neurocomputing**, 603, 12825, October 2024.
- M Jamalifard, J Andreu-Perez, H Hagra, L Mart, "Fuzzy Norm-Explicit Product Quantization for Recommender Systems", **IEEE Transactions on Fuzzy Systems**, Vol. 32, No.5, pp.2987-2998, May 2024.

- K. Maqsood, H Hagra, NR Zabet, "An overview of artificial intelligence in the field of genomics", *Discover Artificial Intelligence*, Vol. 4, No.1, January 2024.
- M Almarash, M Abdulrahim, H Hagra, "A Life-Long Learning XAI Metaheuristic-based Type-2 Fuzzy System for Solar Radiation Modelling", *IEEE Transactions on Fuzzy Systems*, Vol.32, No.4, pp. 2102-2115, April 2024.
- J Fumanal-Idocin, J Andreu-Perez, O Cord, H Hagra, H Bustince, "Artxai: Explainable artificial intelligence curates deep representation learning for artistic images using fuzzy techniques", *IEEE Transactions on Fuzzy Systems*, Vol.32, No.4, pp.1915-1926, November 2023.
- S. Upasane, H. Hagra, M. Anisi, S. Savill, I. Taylor, K. Manousakis, "A Type-2 Fuzzy Based Explainable AI System for Predictive Maintenance within the Water Pumping Industry", *IEEE Transactions on Artificial Intelligence*, Vol.5, No.2, pp. 490-504, May 2023.
- L. Veryard, H. Hagra, A. Conway, G. Owusu, "A Heated Stack based Type-2 Fuzzy Multi-Objective Optimisation System for Telecommunications Capacity Planning", *Knowledge Based Systems*, Vol. 260, pp.110-113, January 2023.
- M. Kiani, J. Andreu-Perez, H. Hagra, "A Temporal Type-2 Fuzzy System for Time-dependent Explainable Artificial Intelligence", *IEEE Transactions on Artificial Intelligence*, pp.1-15, September 2022.
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- Invited to develop a tutorial entitled “Type-2 Fuzzy Logic Controllers: Towards a New Approach for Handling Uncertainties in Real World Environments” for the *IEEE Expert Now Online Tutorials*, January 2009.

## **2. Teaching Profile**

I maintain a strong interest in delivering high quality teaching where I was **Awarded Principal Fellow of the Higher Education Academy (HEA)** which is the highest grade of fellowship of HEA which evidences my teaching excellence. I served as the Director for the MSc Artificial Intelligence, MSc Robotics & Intelligent Systems and MSc Big Data & Text Analytics. I served also as the Programme Chair of the CEEC conference which is organised by the School PhD students which celebrated its 10<sup>th</sup> anniversary and was co-sponsored by the IEEE. I have coordinated and developed new MSc degrees and I have also developed and taught new modules for the undergraduate and postgraduate students. Most of my taught modules involve strong practical element enabling the students to apply the science they learnt to real world problems of industrial relevance. The PFHEA recognized my leading role in advocating research-led teaching and my national and international recognition as leader for aligning the taught courses with industrial based practices and real world applications. Through my industrial links, I tried always to provide different industrial placements and internships for my students.

In 2015, I was *selected as Distinguished Lecturer by the IEEE Computational Intelligence Society*. In 2005, *I was awarded the University of Essex Students’ Union Apple for teacher award*. I was a *visiting professor in the German University in Cairo, the University of Ulm, Germany, University of Granada, Spain, Klagenfurt University, Austria and University of Murcia, Spain*. I have also established an EU ERASMUS exchange programme between the

University of Essex and the University of Ulm in Germany, the University of Pisa, Italy and University of Navarra, Spain. I played a leading role to establish long term academic partnership between the University of Essex and the University of Tainan, Taiwan. I have supervised (to completion) as main supervisor more than ***Thirty Five PhD students and I have supervised numerous M.Sc. and final year B.Sc. dissertations and projects.*** My teaching profile is listed under the following headings.

## **2.1 Development and Teaching of Courses and Programmes**

During my work in the University of Essex, I performed the following teaching activities

- Established ***a new Msc Programme in Artificial Intelligence.***
- Established a ***new Msc Programme*** in Computer Engineering.
- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Pisa, Italy.
- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Navarra, Spain.
- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Tainan, Taiwan.
- Developed and taught a new M.Sc. course *CE801 “Robotics and Intelligent Systems”*
- Developed and taught a new M.Sc. course *CE889 “Neural Networks”*
- Developed and taught a new M.Sc. course *CC467 “Real Time Operating Systems and Field Buses”*
- Taught the M.Sc. course *CC465 “Programming Robotics and Embedded Systems”*
- Taught the M.Sc. course *CE869, “Embedded Systems Co-design”*
- Taught and co-ordinated the M.Sc. course *CC402 “Professional Practice and Research Methodology”*
- Taught the undergraduate course “Object Oriented Programming”
- Taught the undergraduate course “Introduction to Data Bases”

During my work as a Lecturer in Computer science in the University of Hull, I had performed the following teaching activities

- Taught the B.Sc. course *CS272 “Systems Engineering”*
- Taught the B.Sc. course *CS254 “Database systems”*

During my work as a Visiting Professor in Computer science in the German University in Cairo, I taught the following courses:

- Neural Networks
- Fuzzy Logic and Hybrid Systems
- Software Engineering
- Introduction to Robotics
- Advance Research Seminar

## 2.2 Visiting Professor and Invited Lecturer

- Visiting Professor within the IEEE Distinguished Lecturer Programme to University of Ottawa, Canada, April 2018
- Visiting Professor with the IEEE Distinguished Lecturer Programme to Chinese Academy of Science, China, October 2017
- Visiting Professor with the IEEE Distinguished Lecturer Programme to Tunisia, November 2016
- Visiting Professor, University of Granada, Spain, February 2013
- Visiting Professor, University of Klagenfurt, Austria, September 2011
- Visiting Professor, University of Murcia, Spain, May 2011.
- Visiting Professor in the German University in Cairo, Egypt, February 2008-August 2010.
- Visiting Professor to Kaohsiung University, Taiwan.
- Visiting Professor to the National University of Tainan, Taiwan, June 2008.
- Visiting Professor to Bogazici University, Istanbul, Turkey, October 2007.
- Visiting Professor in the University of Florida, USA, April 2007.
- Visiting Professor and invited lecturer in the University of Ulm, Germany where I taught a course entitled “*Intelligent Environments and Embedded Agents*”. This was Funded by the EU Socrates Program, February 2006.

## 2.3 Supervision

During my work in the University of Essex, I performed the following supervision activities

- Supervised (to Completion) as main supervisor **more than Thirty Five Ph.D. students**
- Supervisor and examiner for **more than 200 M.Sc. dissertations**

- I am keen to work and motivate research students where I **acted as the Programme Chair of the CEEC conference which is organised by PhD students and celebrated its 10<sup>th</sup> anniversary and was co-sponsored by the IEEE (this is the only conference in the World sponsored by the IEEE and organised by the students for the students which allow high level of training and exposure opportunities for PhD students).**
- Led a research student team which won the First place in Robocup 2010 (Festo Logistics League).
- Supervisor and examiner for numerous B.Sc. Final year Computer science projects
- Member of the Ph.D. supervisory board for several students

During my work as a Lecturer in Computer science in the University of Hull I had performed the following supervision activities

- Supervised M.Sc. dissertations
- Supervised final year B.Sc. projects

During my work as a Visiting Professor in Computer science in the German University in Cairo

- Supervised 6 M.Sc. dissertations
- Supervised 30 final year B.Sc. projects

## 2.4 Teaching Awards

- **In November 2017, Awarded Principal Fellow of the Higher Education Academy (HEA)** which is the highest grade of fellowship of HEA which evidences my teaching excellence. The PFHEA recognized my leading role in advocating research-led teaching in the school and my national and international recognition as leader for aligning the taught courses with industrial based practices and real world applications.
- In 2015, I was selected as **Distinguished Lecturer by the IEEE Computational Intelligence Society**
- *I was awarded the 2005 University of Essex Students' Union Apple for teacher award*

## 2.5 Establishment of Teaching Exchange Programmes

- Played a leading role to establish long term academic partnership between the University of Essex and Alexandria University, Egypt.
- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Pisa, Italy.

- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Navarra, Spain
- Played a leading role to establish long term academic partnership between the University of Essex and the National University of Tainan, Taiwan.
- Helped to established a European High Education SOCRATES/ERASMUS exchange programme between the University of Essex and the University of Ulm in Germany for the academic years of 2005/2006 and 2006/2007

### 3. Administration Profile

- I served as **Director of Research (June 2017-October 2021)** for the School of Computer Science and Electronic engineering where I led the school preparation for REF 2021 submission which did see [Essex coming 6th in UK for Research Power in Computer Science and Informatics](#) where I led the following achievements:
  - We managed to submit a strong output profile to REF thanks to the various incentives and support mechanisms which I helped to establish during my term as Director of Research.
  - I managed to organise our research groups into only 4 strong world leading groups instead of 13 groups.
  - **In my term as Director of research, the school saw 50% increase in the per annum value of external research awards** compared to REF2014 **with an average value per FTE per annum** which is **above the Russell Group median** for UoA11.
  - Led the development of the school research labs to be world leading research facilities for smart spaces, robotics, brain computer interfaces, embedded systems and communications.
  - Helped to support and encourage cross and interdisciplinary research across the school and faculty which led to World leading publications in Nature, Science and other World leading journals.
  - Established a new publication incentive scheme which resulted in the increase in the number of publications which could be potentially be ranked as 4\* in the REF2021.
  - Established a new incentive scheme to increase the number of citations within the school.
  - Helped to establish a vibrant research culture in the school to enable sustainable research excellence.
  - Developed support mechanisms for new members of staff to support their development and integration in Essex and to fast track their research outputs for Essex.
  - Developed a transparent mechanism for the distribution of resources across the school.
  - Established a new internal review scheme for research grants which aims to provide support and feedback to colleagues (especially new member of staff) before they submit their research grants.

- Worked with colleagues to improve the PhD students inclusion in our research environment.
- I am currently the **Director of Impact and Knowledge Exchange** in the School of Computer Science and Electronic Engineering where I also served in this role between October 2015 and July 2017 where I have the following achievement
  - Developed the school impact strategy and related incentives which led to the production of top quality impact cases submitted to REF 2021.
  - Led the school knowledge exchange, industry and business cooperation which led to Essex to **rank number 1 in the UK in funded Knowledge Transfer Partnership projects.**
  - Led the establishment of a **strategic partnership with British Telecom.**
  - Led the establishment of a **Centre of Excellence in AI with TWI** (the Welding Institute) in Cambridge to disseminate the school research to the fields of civil and mechanical engineering.
  - Served as Head of the Industrial Advisory Board
  - Established the School Industry day to show case our industry and business cooperation

I serve within the School Management team where I have participated in the various recruitment panels for the school Academics (which led to school growth with a big number of members of academic staff) which allowed CSEE to be one of the biggest UOA11 in UK

I am currently **Chairing the Artificial Intelligence Group** in CSEE with the aim to form a leading International research group in AI and their applications.

I am currently the Director of the Centre for Computational Intelligence in the University of Essex, which encompasses 10 academics and more than 25 PhD students and research officers.

I chaired the Intelligent Environments Research Group where I have played a major role in **establishing Essex as world class centre of excellence in Intelligent Environment.**

I have performed many admin duties within the University of Essex where I served as a member of the University Research Strategy Committee. I served as the Postgraduate Teaching Coordinator (Big Data) and I have served as the Undergraduate Area Co-ordinator for Robotics and Embedded Systems and I served also as a member of the overseas admission team. In addition, I served as member of the management committees of various B.Sc. and M.Sc. degree

schemes. Furthermore, I served as a member of the exam moderation committees for various B.Sc. and M.Sc. degree schemes.

#### **4. Knowledge Exchange Profile**

Due to the industrial and application relevance of my research, I have been involved in strong collaboration with industry. This industrial collaboration was in form of collaborative research projects, knowledge transfer, consultancy and appointments in companies' board of directors. This industrial collaboration is of great benefit as besides providing research funding, it also allows the development of courses that are of direct relevance to industry as well as providing industrial placements which will further enhance the skills of the University graduates. Furthermore, this industrial cooperation allows the dissemination of my research into real world products and services which can be useful and helpful to the community.

- **I submitted an Impact case study for REF 2014 and REF 2021 (My impact case was ranked as 4\* in Ref 2021). My impact cases summarised the great success of the knowledge exchange I performed with industry including British Telecom.**
- I have numerous Knowledge Transfer Partnership projects where the majority were graded as Outstanding by Innovate UK and some of them were award winning and all of them generated significant impact on the involved organization.

I have given advice to several UK government agencies including:

- **The UK Government Cabinet Office**
- **The Department of Health and Essex Social Services**

I had collaboration with the following industrial companies as follows:

- **Chief Science Officer, Temenos**
- **Chief Science Officer, Logicalglue Ltd.**
- **HSBC bank, Performed a University based Consultancy with HSBC, in order to develop Explainable AI capacity in HSBC and shape their programme to embed AI in the whole of HSBC organisation.**
- **British Telecom (BT) within the scope of the several funded research projects and fellowships. The work I do with companies like BT was fed by BT to the government to inform the UK R&D roadmap which will help to enhance the University reputation as a leader in industrial based research.**
- **Leonardo (Selex) within the scope of the several funded research projects and fellowships.**

- Hewlett-Packard (HP) within joint research projects in the field of online distance education in Ambient Intelligent Environments.
- MAN B&W which the largest diesel manufacturer in the world. MAN had funded the research project entitled "*An Intelligent Embedded Agent for the speed Control of Marine Diesel Engines*".
- Sanctuary Social Care, Ltd and IP4 Ltd within the scope of three research projects and the collaboration of setting up a joint spin-out company to carry on our joint award winning research.
- Lightwave Technologies Ltd, Nova UCD, Dublin, Ireland, where I was identified by the company as the leading international expert in the field of hybrid fuzzy systems and their applications to intelligent environments. Based on a consultancy agreement with the University I acted as consultant for the company where I have helped them to develop their novel ICE product for energy management and optimisation in huge buildings, this product has resulted in novel patented techniques in which I am the main inventor.
- Sun Microsystems within the scope of research collaboration in the field of embedded hardware platform for the iSpace.
- Intel within research cooperation within the iSpace and field trials.
- LG Consumer Electronics which has collaborated with us within the scope of the project entitled "*A soft-computing based, multi-agent architecture with applications to intelligent building sensing and control*". Furthermore, they have supplied us with their novel internet Fridges (iFridges) for the iDorm and the iSpace.
- Siemens within research cooperation in embedded system and agents in the iSpace.
- In addition to the cooperation with the industrial companies mentioned above, I have **given advice to several government agencies the Cabinet Office on Explainable Artificial Intelligence**. I have also provided advice to the Department of Health and Essex Social Services concerning the application of ambient intelligence and computational intelligence in care environments.

## 5. Profile for Outreach, Public Communication of Science, and Advocacy for Computer Science.

As explained above and as detailed in my CV (Knowledge Exchange Profile), I have strong relations with major international companies (like BT, HSBC, Temenos, Leonardo, etc) as well as government organisations which allows for the outreach, public communication of science

and advocacy of computer sciences which is also evidenced by my high profile media interviews and presentations (such as for **Times, Guardian, BBC, Finxtera, the Economist, the World Economic Forum (Davos), SIBOS (world largest banking conferences), etc**). In 2007, I was shortlisted by Times Higher Education supplement (THES) for the UK Young researcher of the year award and the only researcher nominated from the Computer Science and Engineering domain.

## **6. Commitment to Promoting Awareness and Understanding of Equality, Diversity and Inclusion (EDI).**

This is evidenced by my profile as Director of Research and Impact in CSEE as serving in the University of Essex Research Management committee where I championed the awareness and understanding of equality, diversity and inclusion and realised this as part of our REF strategy. During my role, I introduced the role of departmental inclusivity and disability officer (I&D) supporting staff and students with protected characteristics to ensure everyone has equal opportunity to conduct research productively. During my term, CSEE was awarded a Departmental Athena Swan Bronze Award in 2019.