

## **Manal Helal**

Mobile: 07463782349, manal.helal@gmail.com Website: www.manalhelal.com, moodle.manalhelal.com

### **RESEARCH AND TEACHING EXPERIENCES**

#### **Lecturer – Hertfordshire University – Hatfield, UK (Nov. 2020 : Present)**

- Collaborating on research projects with colleagues and students, leading my research projects and applying for grants.
- Delivering modules for undergraduate and postgraduate computer science departments in the AI and Robotics group by developing curriculum within accreditation requirements constraints for undergraduates and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
  - Level 6 AI and Robotics Applications
  - Level 5 AI
  - Level 6 Intelligent Adaptive Systems
  - Level 7 Fundamentals of Data Science
- Project supervision for undergraduate and graduate master's thesis research projects, mainly in AI and Robotics topics.
- Some admin duties as assigned, for example, UK Robotics Week participation. I delivered a Math Tutoring Trivia Session by Pepper Robot in a 3-day school event to children in grades 3, 4, and 5.
- Awarded NVIDIA academic ambassadorship in 2022. This award enabled me to deliver NVIDIA Deep Learning Institute (DLi) workshops on recent AI advancements, using NVIDIA infrastructure, for free to any university-affiliated student or staff member (otherwise \$500 per attendee). I have delivered Fundamentals of Deep Learning (FDL) workshop since 2023, computer vision for industrial inspection (CV-II) workshop and Applications of AI for Predictive Maintenance (PM), Building Transformer-Based NLP Applications (Trans), and Building LLM Applications With Prompt Engineering Workshop (LLM\_PE) annually twice each, as I add more advanced and recent workshops.
- Published "Introduction to Tensor Computing, from fundamentals to deep learning" book in June 2023. Other publications in <http://www.manalhelal.com/publications/>
- Member of the Technical committee of the annual AI and Robotic Control (AIRC) conferences, and International Telecommunications Conference (ITC).
- Participate in reviewing UKAN+ Funding Calls <https://acoustics.ac.uk/funding/>.

#### **Lecturer/Teaching Fellow – Surrey University – Guildford, UK (Sep. 2018 : Aug. 2020)**

- Delivering modules for undergraduate and postgraduate students in the computer science department by developing curriculum within accreditation requirements constraints for undergraduates and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
  - Undergraduate: computer logic, operating systems, Algorithms, computer networks
  - Postgraduate: fundamentals of data science
- Project supervision for undergraduate and graduate master's thesis research projects, mainly in AI applications.
- Some admin duties include Year Coordinator, Personal Tutoring, Placement Tutor, Open Days, Applicant Days and outreach activities.

- Finished GCLT four Modules in September 2020 and was awarded HEFA

**CVSSP – Surrey University – Research Fellow in Music Source Separation (Feb. 2018:Aug. 2018)**

- Investigating Various Source Separation Algorithms and benchmarking their performance on the SiSEC 2018 music database and evaluation methods.
- These methods include Recurrent Neural Networks, Convolutional Neural Networks, ICA, PCA, NMF, Bayesian methods, and sparse compressive sensing methods. Submitted to SiSEC 2018 only RNN. The extracted features are STFT, spectrogram, and MFCC.

**Lecturer – AASTMT – Cairo - Egypt (Sep. 2012 : Oct. 2017)**

- Delivering Modules for Undergraduate and postgraduate students in computer science and engineering departments by developing curriculum within accreditation requirements constraints for undergraduates and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
  - Undergraduate: computer graphics, data structures, advanced algorithms, system programming, design patterns, programming theory, various programming languages modules
  - Postgraduate: pattern recognition (AI – supervised machine learning mainly), graph theory, parallel and distributed systems, programming theory and compiler design.
- Project supervision for undergraduate and graduate master's thesis research projects
- Some admin duties include: quality assurance committee, examination committee, conference organisation, ACM programming competition tutoring.
- Collaborating in research projects in Machine Learning for different applications,

**University of New South Wales (UNSW) - Part-time Research Assistant, ARC-funded project, APAL linkage grant with EICU, for FBE, Sydney/Australia. (April 2012 : Aug. 2012)**

- Migrating a 3D structure extraction from a motion project from a standalone Windows application to the AWS cloud of GPU Linux instances.

**The University of Sydney – Centre for Infectious Disease and Microbiology – Western Clinical School, Faculty of Medicine, Sydney/Australia – Research Fellow (April 2008 : Jan. 2011 )**

- Apply Computational and Mathematical models to biological data to extract information.
- Developed a high-performance optimal multiple sequence alignment tool.
- Designed a clustering method for DNA sequences to identify species that outperformed state-of-the-art machine learning algorithms at the time.
- Building a database of molecular sequences that interfaces with analysis tools.
- Published the research results in conferences as 1 poster, 1 abstract, 4 conference papers, and 3 journal papers.

**University of New South Wales, Sydney – Computer Science and Engineering Department – Top-up PhD Student and CS Tutor, (March 2004 : Dec. 2007)**

- CS Tutor and Course administrator for various CS Courses.

**University of Technology, Sydney – Information Technology Faculty – Cisco Instructor and CS Tutor (Sept. 2003 : July 2004)**

- Visitor Researcher, Cisco Instructor, and CS Tutor.

**American University in Cairo (AUC) (Jan. 2001 – Aug. 2003)**

- Engineering Services Department – Part-Time Instructor February 2003 - May 2003

- Centre for Adult and Continuing Education (CACE) - Part-Time Instructor for various computing modules, including Cisco CCNA instructor, October 2002 - August 2003
- Computer Science Department, Cairo - Part-Time Teaching Assistant, Teaching Assistant to various undergraduate modules, January 2001 to May 2003

## RESEARCH FOCUS

- Deep Learning for various applications (Robotics, IoT, multiple platforms) using state-of-the-art models for Pattern Recognition, NLP, using various Development environments: Matlab, Java, Python.
- Graph/network analysis and algorithms for various applications, semantic web, graph databases, network alignment, graph neural networks and tensor computing.
- High-dimensional/tensor structures analysis methods for various applications, PhD in partitioning high-dimensional spaces for parallel processing of optimisation algorithms.
- Parallel and Distributed processing experience in different platforms and applications.
- Traditional AI and ML methods include statistical analysis and data visualisation using different algorithms and platforms.

## AWARDS

- Fall 2022 - NVIDIA DLi Academic Ambassadorship.
- Fall 2013 - Awarded NSF/IEEE-TCPP Curriculum Initiative Early Adopter Program to adopt undergraduate curriculum to include PDC (Parallel & Distributed Computing). (<http://www.cs.gsu.edu/~tcpp/curriculum/?q=node/21329/>)
- August 2009 - Received the Branko Cesnik Award for Best Student Scientific Paper for the paper titled "Dynamic programming algorithms for discovery of antibiotic resistance in microbial genomes," published in Proceedings of the Health Informatics Conference (HIC-09) - Canberra, Australia, August 2009.
- February 2009 - Sponsored by the NSF (National Science Foundation, Arlington, Virginia, USA) to participate in the "Future Directions in Tensor-Based Computation and Modelling" workshop.
- March 2005 - Awarded the UPA (University Postgraduate Award) scholarship for the PhD study at the University of New South Wales, Sydney, Australia.

## EDUCATION

- **University of New South Wales (UNSW)** - March 2010 PhD in Computer Science
- **The American University in Cairo (AUC)** - January 2001 MSc in Computer Science
- **The American University in Cairo (AUC)** - January 1995 BSc in Computer Science

## ADDITIONAL RELEVANT EXPERIENCE

**CMCRC, Database Administrator**, Dec 2007 – April 2008

- Stock Analysis Application Development using Data Mining: Regression

**12+ years in ERP systems, BI, DB development/admin, and networking.**

**Certifications:** Statistical analysis (UCL), Cisco networking, DB development, bioinformatics, acoustics, ML/DL.

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

IEEE Professional member since 2003 and previously a student member.