Manal Helal
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RESEARCH & TEACHING EXPERIENCES

Lecturer – Hertfordshire University – Hatfield, UK (November 2020 - Present)
- Collaborating in research projects with colleagues and students, and leading my research projects and applying for grants.
- Delivering Modules for Undergraduate and postgraduate in computer science department by developing curriculum within accreditation requirements constraints for undergraduate and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
- Projects supervision for undergraduate and graduate master thesis research projects
- Some admin duties as assigned.

Teaching Fellow – Surrey University – Guildford, UK (September 2018 - August 2020)
- Delivering Modules for Undergraduate and postgraduate in computer science department by developing curriculum within accreditation requirements constraints for undergraduate and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
  - Undergraduate: Computer Logic, Operating Systems, Advanced Programming, Computer Networks
  - Postgraduate: Data Science
- Projects supervision for undergraduate and graduate master thesis research projects
- Some admin duties including: Year Coordinator, Personal Tutoring, Open Days and Applicant Days and outreach activities.
- Finished GCLT four Modules in September 2020 and awarded HEFA

CVSSP – Surrey University – Research Fellow in Music Source Separation - February 2018 – August 2018
- Investigating Various Source Separation Algorithms and benchmarking them performance on the SiSEC 2018 music database and evaluation methods.
- These methods include Recurrent Neural Networks, Convolutional Neural Networks, ICA, PCA, NMF, Bayesian methods, sparse compressive sensing methods. Submitted to SiSEC 2018 only RNN.Features extracted are stft, spectrogram, MFCC.

Lecturer – AASTMT – Cairo - Egypt (September 2012 - October 2017)
- Delivering Modules for Undergraduate and postgraduate in computer science and engineering departments by developing curriculum within accreditation requirements constraints for undergraduate and keeping up with research development in postgraduate modules. Preparing assessments, marking and student feedback
  - Undergraduate Modules: Graphics, Data Structures, Advanced Algorithms, System Programming, Design Patterns, Programming Theory, Various Programming Languages Modules
  - Post Graduate: Graph Theory, Parallel & Distributed Systems, Pattern Recognition, Programming Theory & Compiler Design
- Projects supervision for undergraduate and graduate master thesis research projects

- Some admin duties including: 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, APAI linkage grant with EICU, for FBE,, Sydney/Australia. April 2012 – August 2012
- Migrating a 3D structure from motion project from standalone windows application to AWS cloud of GPU linux instances

University of Sydney – Centre for Infectious Disease and Microbiology – Western Clinical School, Faculty of Medicine, Sydney/Australia – Research Fellow April 2008 - January 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.
- Building a database of molecular sequences that interfaces with analysis tools.
- Published the research results in conferences as 1 poster, 1 abstract, and 4 conference papers, 3 journal papers, and there are some unpublished work.

University of New South Wales, Sydney – Computer Science and Engineering Department – Topup PhD Student and CS Tutor March 2004 - December 2007
- CS Tutor and Course administrator for various CS Courses.

University of Technology, Sydney – Information Technology Faculty – Cisco Instructor and CS
Tutor September 2003 - July 2004
- Visitor Researcher and Cisco Instructor and CS Tutor.

American University in Cairo (AUC) January 2001 - August 2003
- Engineering Services Department – Part Time Instructor February 2003 - May 2003
- Center for Adult and Continuing Education (CACE) - Part Time Instructor for various computing modules including Cisco CCNA instructor, October2002 - August 2003
- Computer Science Department, Cairo - Part Time Teaching Assistant, Teaching Assistant to various undergraduate modules, January 2001 to May 2003

RELEVANT RESEARCH SKILLS
- Deep Learning for various applications using different models: Pattern Recognition, NLP, anomaly detection using various platforms: initially matlab and java, now python mainly.
- Graph/network analysis and algorithms for various applications, semantic web, graph databases and network alignment, recently graph neural networks
- High dimensional/tensor structures analysis methods for various applications, PhD in partitioning for parallel processing, and recent research interest in application in Deep learning.
- Parallel and Distributed processing experience in different platforms and applications.
- Traditional AI and ML methods including statistical analysis and data visualisation using different algorithms and platforms.

AWARDS

- 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 Awards 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 Modeling" workshop.
- March 2005 - Awarded the UPA (University Post-graduate 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

More than 12 years of industrial experience working on ERP systems, database development and administration and network administration.
Various Training certificates in statistical analysis of medical datasets, networking, database development and administration, summer schools in Bioinformatics, machine learning and deep learning.

MEMBERSHIP OF PROFESSIONAL SOCIETIES
IEEE Professional member since 2003, and previously a student member.

REFEREES
Dr Andrew Crossan, Director of Learning and Teaching, University of Surrey, BB - Alan Turing Building 2nd Floor, Computing, Guildford, Surrey, GU2 7XH, UK, +44 (0)1483 300800, a.crossan@surrey.ac.uk

Prof. Saleh Mesbah Elkaffas, Head of Remote Sensing and Spatial Studies Unit, College of Engineering and Technology, AAST, Abou-Keer, Alexandria, EGYPT. +2 0100 522 8715, saleh.mesbah@aast.edu,   saleh.mesbah@gmail.com

Prof. Vitali Sintchenko - Senior Research Fellow – Medical School-Westmead, The University of Sydney T: +612 9845 6255 F : +61 2 9893 8659 E. vitali.sintchenko@sydney.edu.au, Sydney

Medical School-Westmead, Centre for Research Excellence in Critical Infection,Level 4, Millennium Institute 176 Westmead, NSW, 2145, Australia

PUBLICATIONS
JOURNAL PAPERS

(*) Helal, M.E., Kong, F., Chen, S.C.A., Zhou, F., Dwyer, D.E., Potter, J., Sintchenko, V. Linear normalized hash function for clustering gene sequences and identifying reference sequences from multiple sequence alignments, Microbial Informatics and Experimentation, 2(2), January 2012.

(*) Helal, M.E., Kong, F., Chen, S.C.A., Bain, M., Christen,R., Sintchenko, V. Defining reference sequences for Nocardia species by similarity and clustering analyses of 16S rRNA gene sequence data, PLoS ONE , 6(6), June 2011.

Helal, M, Sintchenko, V. Dynamic programming algorithms for discovery of antibiotic resistance in microbial genomes. Electronic Journal of Health Informatics 2011; 6(1):e10. ISSN: 1446-4381.

CONFERENCE PAPERS

Helal, Manal E., and Hussein Hamed Ghouz. 2017. "On Signal Reconstruction Algorithms and Speedup Opportunities." In National Radio Scientific Conference (NSRC) Alexandria, Egypt, 13-16 March 2017, pp (186– 96). IEEE. doi:10.1109/NRSC.2017.7893503.

Abdel Azeem, B., Helal, M., Performance Evaluation of Checkpoint/Restart Techniques for MPI Applications on Amazon Cloud, In Proceedings of the 9th INFOS 2014 International Conference on Informatics and Systems, Cairo, Egypt, 15-17, December 2014., Accepted the 25th of October 2014.

(*) Helal, M., Mullin, L., Potter, J., Sintchenko, V. Search Space Reduction Technique for Distributed Multiple Sequence Alignment. In Proceedings of the 6th IFIP International Conference on Network and Parallel Computing (NPC 2009). Gold Coast, Queensland, Australia, October 2009.

(*) Helal, M., Sintchenko, V. Dynamic programming algorithms for discovery of antibiotic resistance in microbial genomes, In Proceedings of the Health Informatics Conference (HIC-09). - Canberra, Australia, August 2009.

(*) Helal, M., El-Gindy, H., Mullin, L., Gaeta, B. Parallelizing Optimal Multiple Sequence Alignment by Dynamic Programming. In Proceedings of the International Symposium on Advances in Parallel and Distributed Computing Techniques (APDCT-08) held in conjunction with 2008 IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA-08). Sydney, Australia, December 2008. pp. 669-674. ISBN: 978-0-7695-3471-8.

(*) Helal M., El-Gindy, H., Gaeta, G., Sintchenko, V. High Performance Multiple Sequence Alignment Algorithms for Comparison of Microbial Genomes. In proceedings of the 19th International Conference on Genome Informatics - GIW 2008. - Gold Coast, 2008.

(*) Helal, M., Mullin, L.M., Gaeta, B., El-Gindy, H. Multiple sequence alignment using massively parallel
mathematics of arrays. In proceedings of the International Conference on High Performance Computing,
Networking and Communication Systems (HPCNCS- 07), Orlando, FL. USA, 2007. pp. 120-7.

Helal, M., Mullin, L., El-Gindy, H., Gaeta, B. Optimal Parallel Solution for Multiple Sequence Alignment Using Mathematics of Arrays. Poster presentation presented at Bioinformatics Australia 2006 "Connecting Australian Bioinformatics" 21-22 November 2006, Sydney Convention and Exhibition Centre, Darling Harbour, Sydney, NSW, November 2006.

Helal, M., Mullin, L., Gaeta, B., El-Gindy, H. Multiple Sequence Alignment Using Massively Parallel
Mathematics of Arrays. Poster presentation presented at BioInfoSummer 2005 - ICE-EM Summer Symposium in Bioinformatics, The Australian National University, Canberra, Australia, November 2005.

Helal, M., Mullin, L., Gaeta, B., El-Gindy, H. Multiple Sequence Alignment Using Massively Parallel Mathematics of Arrays. Poster presentation presented at the APAC Conference and Exhibition on Advanced Computing, Grid Applications and eResearch , Royal Pines Resort, Gold Coast, Australia, September 2005.

(*) Sameh, M. A., Helal, M.E., Dimension and Shape Invariant Array Programming: The Implementation and the Application", Poster in the ISCA 17th Int'l conference on Computer Automation and Their Applications (CATA-2002), April 4-6, 2002, San Francisco, USA

(*) Sameh, M. A., Helal, M.E., Dimension and Shape Invariant Programming - The Implementation and the Application, Proceedings of the 3rd WSEAS Symposium on Mathematical Methods and Computational Techniques in Electrical Engineering, Athens, Greece, December 29-31, 2001.

Departmental/Research Working Papers
Helal, Manal E., "Patent Mining by Extracting Functional Analysis Information Modelled As Graph Structure: A Patent Knowledge-base Collaborative Building Approach", submitted and waiting for review results.

Books - Short Works

Sameh, M. A., Helal, M.E., Dimension and Shape Invariant Array Programming: The Implementation and the Application Recent Advances in Simulation, Computational Methods, and Soft Computing, Book, Electrical and Computer Engineering Series, Editor: Nokos Mastorakis, WSEAS Press, 2002