

DEPARTMENT OF COMPUTING



Dr. Ezra K. Mugisa, PhD London Imperial College, DIC, CITP
Head of Department

WORK OF THE DEPARTMENT

Curriculum Review

Having completed the major review of our undergraduate courses and programmes the Department mounted three programmes and two majors as follows:

Programme	Majors
BSc (General)	Computer Science Software Engineering
BSc Information Technology (also offered at WJC)	
BSc Computer Systems Engineering (with Mona School of Engineering)	

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We turned our attention to a review of the postgraduate programmes with a view to bringing them in line with our revised undergraduate offering.

WESTERN JAMAICA CAMPUS

We continue to experience challenges with the infrastructure for live streaming of lectures to WJC. Whereas, as an alternative, we may be able to use available software to interact remotely with small groups of students at WJC, this will become more difficult as the number of students grows.

INDUSTRY ADVISORY BOARD

Following a recommendation from the quality assurance review of the Department, we had the inaugural meeting of our Industry Advisory Board on October 9, 2013. The membership was initially made up of representatives from the following organisations: Fiscal Services (eGov Jamaica Limited), Ministry of STEM, PSOJ, BOJ, Lime, and Development Consortium International.

WAVE LAB

Funded by a New Initiative Grant for the project “Enabling cutting edge research in Interactive Computing and New Media Technology: The Web, Animation, Visualisation and E-learning (WAVE) Research Laboratory“ (P.I. Dr A.G. Hamilton-Taylor), the WAVE lab was opened to coincide with UWI Research Days 2014 in space renovated by the Department of Computing. It provides facilities for natural user interface/virtual reality, 3D stereoscopic displays, 3D stereoscopic video recording, ergonomic input devices, and surround-sound. It is the first computing facility of its type at UWI, and to the best of our knowledge, at any tertiary institution in CARICOM. The WAVE lab is currently being utilised by postgraduate students pursuing their research projects under the supervision of Dr Hamilton-Taylor. An undergraduate group completed a final-year capstone project to control a robotic arm by using

natural user interfaces to monitor and interpret the gestures of a human. Given its initial size, the WAVE lab caters primarily to postgraduates and undergraduates pursuing special projects. However, first-year undergraduate students have been afforded the opportunity for introductory interaction with this cutting-edge technology in the Computing & Society course.

BOOK LAUNCH

Dr. Gunjan Mansingh and co-editors Dr. Lila Rao-Graham and Professor Kweku-Muata Osei-Bryson launched their book on February 20, 2014 during Research Days activities – book title: *Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries*; publisher: Springer

STAFFING

There were two additions to the staff of the department. We welcomed Dr. Simon Ewedafe as a new senior lecturer, specialising in Parallel and Distributed Computing, Numerical Parallel Computation, and Numerical Analysis (Partial Differential Equations). He arrived in January 2014. Dr. Claudine Allen accepted her appointment as lecturer, specialising in software engineering, and she was slated to report in September 2014. This brings the complement of full-time academic staff to twelve: three senior lecturers, six lecturers and three assistant lecturers. We also employed the services of six part-time lecturers. Dr. Gunjan Mansingh was on sabbatical during the academic year and was replaced by Mrs. Careene Rodney, who was appointed as Special Instructor.

The contracts of two Visiting Professors were renewed for two more years from October 2013. They are Professor Kweku-Muata Osei-Bryson, Professor of Information Systems, Virginia Commonwealth University, Richmond, VA, USA and Professor Robert France, Professor of Computer Science, Colorado State University, USA. The two senior professors continue to work with junior staff and research students, while making important contributions to curriculum development and other matters.

Professor Osei-Bryson visited the Department twice during this academic year and met research students and interested junior staff.

Our administrative unit continues to be ably run by Mrs. Donna Burke, Senior Administrative Assistant, Mrs. Fiona Porter-Lawson, Administrative Assistant II and Miss Kerry-Ann Wilkinson, Secretary III.

PUBLICATIONS

Books

- Osei-Bryson, K. M., **Mansingh G.** and Rao-Graham L (editors). Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries, Springer, *Integrated Series in Information Systems* (2014). <http://link.springer.com/book/10.1007>

Chapters in Books

- Osei-Bryson, K. M., **Mansingh G.** and Rao-Graham L. “Understanding and Applying Knowledge Management and Knowledge Management Systems in Developing Countries: Some Conceptual Foundations.” In Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries, Editors Osei-Bryson, K. M., Mansingh G. and Rao-Graham L. Publisher Springer *Integrated Series in Information Systems* (2014) pp. 1–16.
- **Mansingh G.**, Osei-Bryson, K. M. and Reichgelt H. “Managing Expert Knowledge to Assist in Management of Coffee Pests and Diseases in Jamaica.” In Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries, Editors Osei-Bryson, K. M., Mansingh G. and Rao-Graham L. Publisher Springer, *Integrated Series in Information Systems* (2014) pp. 43–56.
- **Anderson, R.** and **Mansingh G.** “Migrating MIS to KMS: A Case Study of Social Welfare System.” In *Knowledge Management for Development: Domains, Strategies and Technologies for Developing*

Countries, Editors Osei-Bryson, K. M., Mansingh G. and Rao-Graham L. Publisher Springer, *Integrated Series in Information Systems* (2014) pp. 93–110.

- **Mansingh G.** and Rao-Graham L (2014). “The Role of Ontologies in Developing Knowledge Technologies.” In Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries, Editors Osei-Bryson, K. M., Mansingh G. and Rao-Graham L. Publisher Springer, *Integrated Series in Information Systems* (2014) pp. 145–156.
- **Mansingh G.**, Osei-Bryson, K. M. and Reichgelt H. “Knowledge Sharing in the Health Sector in Jamaica: The Barriers and the Enablers.” In Knowledge Management for Development: Domains, Strategies and Technologies for Developing Countries, Editors Osei-Bryson, K. M., Mansingh G. and Rao-Graham L. Publisher Springer, *Integrated Series in Information Systems* (2014) pp. 43–56.3

Refereed Journal Articles

- **Ewedafe S. U.**, and Rio H. S. “On the Parallel Design and Analysis for 3-D ADI Telegraph Problem with MPI”. *International Journal of Advanced Computer Science and Applications (IJACSA)*, Vol. 5. No. 4, (2014) pp. 122–129
- Rao L., **Mansingh G.** and Duggan Evan. “An Ontology of Controversial Terms at the Core of the Systems Life Cycle”. *International Journal of Metadata, Semantics and Ontologies*, 9(3) (2014), pp 171–183.

Peer-reviewed Conference Proceedings

- **Beckford, Carl** and **Mugisa, Ezra** (2014) “Generating A Clash Free Teaching Timetable”. In Proceedings of KES Conference on Smart Technology based Education and Training 2014: KES (STET 2014), Chania, Greece, June 2014.
- **Busby-Earle, C.**, France, R. B. and Ray, I.: “Analysing Requirements to Detect Latent Security Vulnerabilities”. In Proceedings of the

IEEE Eighth International Conference on Software Security and Reliability – Companion (SERE-C), San Francisco, California, 2014, pp. 168–17

- **Ewedafe Simon Uzezi** and Rio Hirowati Shariffudin. “On the Parallel Performance of Stationary Iterative Technique with MPI on 1-D Bio-Heat using Domain Decomposition”. In Proceedings 6th International Conference from Scientific Computing to Computational Engineering (6th-IC-SCCE), Athens, Greece, 7–10 July, 2014
- V. F. Taylor and **D. T. Fokum**, “Mitigating Black Hole Attacks in Wireless Sensor Networks Using Node-Resident Expert Systems”. In Wireless Telecommunications Symposium 2014 (WTS 2014), Washington, DC, USA, Apr. 2014, pp. 1–7.
- R. Bedward and **D. T. Fokum**, “A Cloud Computing Adoption Approach for Jamaican Institutions”. In Proc. IEEE SoutheastCon. Lexington, KY, USA: IEEE, Mar. 2014.
- **Paul Gaynor** and **Daniel Coore**: “Towards Distributed Wilderness Search using Reliable Distributed Storage Device built from a Swarm of Miniature UAVs.” In Proceedings of the The 2014 International Conference on Unmanned Aircraft Systems (ICUAS'14), Orlando, FL, May 27–30
- **Jason Murphy** and **Daniel Coore**: “Towards an Extensible Calculus for Spatial Computing”. In Proc. IEEE SoutheastCon. Lexington, KY, USA: IEEE, Mar. 2014.
- **K. Miller** and **G. Mansingh**, “Towards a distributed mobile agent decision support system for optimal patient drug prescription”. In Proceedings of Third International Conference on Innovative Computing Technology (INTECH), 2013, Aug 29–31, 2013, pp. 233–238.

Technical Reports

- Busby-Earle, C., France, R., and Ray, I.: “Analysing Requirements to Detect Latent Security Vulnerabilities”. Computer Science Technical Report, Colorado State University, Fort Collins, Colorado, 2013

INCOME GENERATION

Dr. Simon Ewedafe was awarded a New Initiative Grant of J\$1,395,000 for the project, “Distributed Cluster System for Scientific and Engineering Computation: A Case for Atmosphere Process (AP) and Active Thermal Control Process (ATP)”. The grant becomes effective August 2014.

We continued to run a number of income-generating activities as shown in the table below:

Programme/Activity	Income	Expenditure	Net Income
MSc Computer Science	25,277,839.45	5,127,854.29	20,149,985.16
MSc CBMIS			n/a
Cisco Networking Academy	2,073,966	1,649,489	424,477.00
Summer School	500,000	490,910.99	33,478.97
Consultancy	3,474,067.14	464,809.58	3,009,257.56

PUBLIC SERVICE**Curtis Busby-Earle**

- He was contracted by the Inter-American Development Bank (IDB) to diagnose the state of the Information Technology systems of the Jamaican National Insurance Scheme, to propose possible improvements and design a new, core software system. October 2013–March 2014
- Through the Ministry of Science, Technology, Energy and Mining he was invited to be a member of the National Cybersecurity Task Force (NCSTF) and Chair of the Human Resources and Capacity Building sub-committee. The NCSTF has been responsible for the

development of Jamaica's first national policy and strategy on cyber security. July 2013–Present

Daniel Fokum

- Reviewer: IEEE Transactions on Vehicular Technology and IEEE Southeastcon 2014.

Gunjan Mansingh

- Reviewer for *INFORMs – Journal of Computing*.
- Organized and conducted a 2 Day Business Intelligence Workshop in collaboration with Tax Administration of Jamaica (TAJ), November 27-28, 2013, Kingston, Jamaica.
- A Track chair for International Conference on Information Resources Management – Conf-IRM 2014 and 2015 – ICT in ASEAN, Latin America and the Caribbean.
- A reviewer for journal *Knowledge Management Research and Practice Journal*, 2014.

Wright J.-M. and **Mansingh G.** (2014). An algorithm to extract Jamaican geographic locations from news articles – Using NLP techniques. Proceedings: International Conference on Information Resources Management (Conf-IRM) – Big Data: Revolutionizing How We Live, Work, and Think. Ho Chi Minh City, Vietnam, 21st-23rd May, 2014.

- External Examiner for University of Western Cape, MSc. Thesis.

Ezra K. Mugisa

- Member UCJ ICT Accreditation Committee
- Member International Programme Committee, First International KES Conference on Smart Technology based Education and Training

STUDENTS

Student Throughput

The table below shows a breakdown of the numbers of students who graduated from the various programmes we offer:

Programme	BA (CS)			BSc (CS)			MSc (CBMIS)			BSc (SWEN)			MSc (CS)			MPhil		
Faculty	FHE			FST			FSS/FST			FST			FST			FST		
Gender	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
1st Class					1	1	9	4	13				1	1	2			
2nd Class (upper)				6	2	8				1	2	3		1	1			
2nd Class (lower)	1	2	3	10	1	11								1	1			
Pass	2		2	2	1	3	11	9	20				3	3	6	1		1
Total	3	2	5	18	5	23	20	13	33	1	2	3	4	6	10	1		1

STUDENT AWARDS AND PRIZES

Karl Robinson Prize

Gabriel Watson won the Karl Robinson Award for best performance in Computing Courses up to semester 1 of year 3 in the programme.

Software Applications Developed by Students

For their capstone project students typically develop application to solve various kinds of problems. Some of these applications are subsequently enhanced and deployed to solve real problems. Two systems that have been developed in this way are:

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1. Blood Donor Management System – A web-based software application that will eliminate the paper-based management of blood donors, and will also allow information to be ascertained from the demographic data collected, e.g. if there is a short supply of a rare blood type, and that blood type is needed for an emergency, where in Jamaica is there a particularly (relatively) high concentration of donors of that blood type. It will also provide features such as sending reminders to regular donors on their next appointment to donate blood. This application was tested “live” during the recently held UWI blood drive.
2. Fuel Retailers Management System – A web-based system that will assist gas marketing companies to have greater control over their franchises. It will assist in the re-ordering process, development of marketing strategies and greater control over who and where franchisees obtain their fuel.