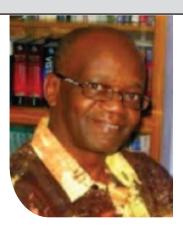# DEPARTMENT OF COMPUTING

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

OVERVIEW

The Department of Computing continues to offer multiple undergraduate and postgraduate programmes. We regularly revise our undergraduate programmes to keep them in line with international curriculum recommendations for computing. In 2016/2017 we started offering the new and revised minors in Information Technology, Software Engineering and Computer Science. Additionally, in 2016/2017 our objective was to strengthen the Masters programmes and offer a new programme, B.Sc. in Software Engineering. The Masters in Computer Science (M.Sc.) and the Masters in Computer Based Information Systems (CBMIS) – offered jointly with Mona School of Business and Management) were revised and a set of new courses were designed to be delivered in the academic year 2017/2018.

The academic year 2016/2017 was a productive one as our undergraduate student numbers continue to grow despite infrastructural problems. Staff

members continue to publish in peer reviewed journals, books, book chapters and conference proceeding; maintain good teaching scores and engage in various professional activities. Overall the department is growing stronger as most of the staff members now have a PhD degree or are close to completion.

In July 2017, Professor Osei-Bryson, the visiting professor to the department, spent two weeks mentoring and advising the research students and young staff members. We have benefited tremendously from this relationship, as he continues to be a valuable resource by assisting us with identifying external examiners and supervising MPhil and PhD students.

Programmes

The BSc Software Engineering (Mobile Application Development) programme offered by the newly established UWI-China Institute of Information Technology (UWICIIT) through the Faculties of Science and Technology, in collaboration with the Global Institute of Software Technology (GIST) of Suzhou, China was introduced in 2016/2017. This programme started with 28 full time students at the Mona Campus and 8 full time students at the Cave Hill Campus. Six (6) courses were delivered via streaming from Mona to Cave Hill and four (4) from Cave Hill to Mona. Streaming of these courses was a challenge due to a lack of proper technical infrastructure primarily on Mona Campus. The programme is one of the first initiatives of the Single Virtual University (SVU) initiative. Head of the Department, Dr. Ezra Mugisa, travelled to China with the Dean of the Faculty, Professor Paul Reese, Vice-Chancellor, Professor Sir Hilary Beckles and other senior members from the University to sign a MOU with GIST in Suzhou and Jiangsu University China, to establish the Jiangsu University Suzhou Caribbean Institute.

We continue to offer the BSc IT programme at WJC. However, the number of students has not grown as we would have liked. We have identified a number of challenges that may have contributed to this situation and are seeking to rectify them in order to get a substantial intake in 2017/18.

We continue to encounter serious challenges in accessing streaming equipment for delivery of our courses to WJC and to Cave hill campus. In this regard we are looking at using alternative technologies to give our students a high quality experience.

The student numbers registered in the various undergraduate and postgraduate courses and the number of students graduating are given in tables 1–2, respectively. In table 2 graduating numbers are also separated into Males/Females. The number of graduates is up from 59 in 2015–2016 to 79 in 2016/2017, a growth of 33%.

Table 1: Student numbers registered in Computing in last five years

Level	2012–2013 Sem 1/Sem 2	2013–2014 Sem 1/Sem 2	2014–2015 Sem 1/Sem 2	2015–2016 Sem 1/Sem 2	2016–2017 Sem 1/Sem 2
Undergraduate					
Introductory	352/367	387/355	463/433	528/433	521/470
Advanced	150/179	190/203	227/240	282/281	318/299
Postgraduate					
M.Sc. Comp.Sci	58	67	64	39	36
M.Sc. CBMIS	37	29	15	32	29
PGDIT	n/a	n/a	n/a	17	n/a
M.Phil.	12	12	15	12	9
PhD	4	4	4	6	5

Table 2: Students graduating across majors in 2016/2017

Major	First Class M/F	Upper Second M/F	Lower Second M/F	Pass M/F	Total M/F
Computer Science	4/5	16/5	11/4	11/2	42/16
Computer Systems Engineering	2/0	2/0	1/0	1/0	6/0
Information Technology	0/0	1/5	4/1	0/1	5/7
Software Engineering	0/0	2/0	1/0	0/0	3/0
Total	**6/5**	**21/10**	**17/5**	**13/3**	**56/23 = 79**

Outreach and Public Service

The department participated in the Orientation village and Science in the Garden (at Hope Gardens) with the aid of the Computing Society. The outreach coordinator, Dr. Paul Gaynor, with student volunteers participated in the Eastern Fair with a visit to Morant Bay High School and other schools in that region. The department also participated in Relay for Life and demonstrated a prototype of a Sign Language Converter. Mr. Ricardo Anderson, the lecturer at WJC, hosted several CAPE Computer Science Seminars both for students and computer science teachers in Western Jamaica parishes from October 2016–April 2017.

International Girls in ICT Day – Dr. Gunjan Mansingh and Dr. Claudine Allen along with the female students in the department participated in the activities organized for Girls in ICT Day Caribbean Hackathon 2017 which was held on April 27 2017. The event had 70,753 viewers across 10 countries. Dr. Mansingh was a speaker at the event and also the moderator for a panel – Conversation on "The Future of Women in Tech – Driving Business Innovation". Some female students acted as mentors for high school teams and others participated in the Hackathon challenge. The UWI computing female students played an important role in helping the organizers in refining the hackathon challenge and acted as a think tank for various activities. Ms. Shanice Bryan, a third year student, won a tablet for the best volunteer for the leadership she displayed in assisting the organizers.

Computing Society – The Computing Society students developed an Android mobile app for the Faculty of Science and Technology under the mentorship of Dr. Gunjan Mansingh. The students developed the first version of the app within a month and the app was put into production in September 2016. This app could be downloaded by incoming students to access information related to the Faculty.

Income Generation

We continued to run a number of income-generating activities as shown in table 3.

Table 3: Income Generation in the Department

Programme/Activity	Income	Expenditure	Net Income
MSc. Computer Science	4,332,000.00	7,171,409.97	-3,385,429.97
Summer School	2,459,674.00	1,838,186.52	621,487.48
CISCO Networking Academy	1,586,642.94	1,428,733.55	157,909.39
Consultancy	476,443.16	57,740.00	418,703.16

Awards and Prizes

- Professor Daniel Coore received the Silver Musgrave Medal for Science (2017).
- The Karl Robinson Award was won by Ms. Kimberly Soares. The award is given to the student with the highest average in the first year, second year and semester I of the third year Computer Science courses.

PUBLICATIONS AND PRESENTATIONS

The department's research output amounted to 20 refereed publications in journals and conference proceedings as indicated below and one (1) edited book.

Book and Book Chapters

- **Anderson, R.** and L. Longsworth, eds. (2016). *Economic Transformation of Jamaica: Policies, Competitiveness and Technology Innovations*. Trafford Publishing (360 pages).
- **Mansingh G.,** Rao L., McNaughton M. (2017) Discovering Knowledge Nuggets in Financial Data: The Case of a Financial Services Institution. In: Rocha Á., Correia A., Adeli H., Reis L., Costanzo S. (eds) *Recent Advances in Information Systems and Technologies*. WorldCIST 2017.

Advances in Intelligent Systems and Computing, Vol. 570, pp. 518–527, Publisher Springer.

Journals

- **Beckford, C**. and **E. Mugisa** (2017). "Towards Optimality in Online Learning – The OLeCenT Approach". *Advances in Science, Technology and Engineering Systems Journal*, 2(1): 819–838. https://doi.org/10.25046/aj0203103.

- Feins R. H., H. M. Burkhart, J. V. Conte, **D. N. Coore**, J. I. Fann, G. L. Hicks, J. C. Nesbitt, P. S. Ramphal, K. R. Shen, A. Sridhar, P. W. Stewart, J. D. Walker, N. A. Mokadam (2017). "Simulation-based training in cardiac surgery". *The Annals of Thoracic Surgery* 103 (1), pp 312–321.

- Mokadam N. A., J. I. Fann, G. L. Hicks, J. C. Nesbitt, H. M. Burkhart, J. V. Conte, **D. N. Coore**, P. S. Ramphal, K. R. Shen, J. D. Walker, R. H. Feins (2017). "Experience with cardiac surgery simulation curriculum: results of the resident and faculty survey". *The Annals of Thoracic Surgery* 103 (1), pp 322–328.

- **Ewedafe S. U**., & Rio H. S. (2017). "Parallelization with MPI on 1-D Active Thermal Control Problem". *Communications on Applied Electronics*, Vol. 6, Issue 7: 41–46 (http://www.caeaccess.org/archives/volume6/number7/706-706-2017652513).

- Rao L., McNaughton M. and **Mansingh G.** (2017). "An Agile Approach for Academic Analytics: A Case Study". *Journal of Enterprise Information Management.* 30(5), pp. 701–722. http://www.emeraldinsight.com/doi/abs/10.1108/JEIM-06-2016-0121.

- **Uwaoma, C.** and **G. Mansingh** (2017). "Proposing a decision support system for automated mobile asthma monitoring in remote areas". *Information Technology for Development*, published online 01 May 2017, pages 1–14 http://dx.doi.org/10.1080/02681102.2017.1310712.

Conference Proceedings (Peer-Reviewed)

- **Anderson, R.** and **G. Mansingh** (2017). "A Workflow Management System for Knowledge Management Initiatives". In Proceedings of the 23rd Americas Conference on Information Systems (AMCIS 2017), August 2017, Boston, MA.

- **Anderson, R.** and **G. Mansingh** (2017). "Knowledge Management and WfMS Integration". In Proceedings of the 16th International Conference on Information & Knowledge Engineering, IKE'17: 2017, Las Vegas, USA.

- **Beckford, C.** and **E. Mugisa** (2016). "OLeCenT, A Tool towards Improving Online Learner-Centric Course Delivery". In Proceedings of the Future Technologies Conference (pp. 385–394). 6–7 December 2016, San Francisco, USA. Institute of Electrical and Electronics Engineers (IEEE). https://doi.org/10.1109/FTC.2016.7821638.

- **Beckford, C.** and **E. Mugisa** (2016). "Ricoché – Providing Learner-Centric Scheduling in a Blended Learning Environment". In Proceedings of the International Conference of Education, Research and Innovation (pp. 1852-1862). 17–19 November 2016. Seville, Spain. International Academy of Technology, Education and Development (IATED). https://doi.org/10.21125/iceri.2016.1414.

- **Drummonds, A. O.** and **D. T. Fokum** (2017). "A robust "Plug-and-Play" application for executing virtualized indoor Wi-Fi localization". In Proceedings of the SoutheastCon 2017, Charlotte, NC, March 2017, pages 1–5.

- **Ewedafe S. U**. (2016). "On the Parallelization of 2-D ATCP using Stationary Iterative Schemes on PVM". 3rd Innovative and Analytics Conference & Exhibition (IACE2016) Kedah, Malaysia, 31 Oct. – 1 Nov, 2016, pages 1–8.

- **Ewedafe S. U**. (2017). "Parallel Solution for 2-D Active Thermal Control Process with ADI Scheme on PVM". 7th International Conference on Experiments/Process/System Modeling/Simulation & Optimization (7 th IC-EPsMsO) Athens Greece, July 5–8, 2017, Athens, Greece, pages 1-7.

- **Jones D.** and **Mansingh G.** (2016). "Not Just Dissimilar, but Opposite An Algorithm for Measuring Similarity and Oppositeness between Word". In Proceedings of Third IEEE International Conference on Data Science and Engineering ICDSE, August 23–25, 2016, Kerala, India. Available on IEEE Xplore DOI**:** 10.1109/ICDSE .2016.7823936.

- **Mansingh G.**, Osei-Bryson K.-M., Rao L. and McNaughton M. (2016). "Market Basket Analysis in the Financial Sector – A Customer Centric Approach". Pre-ICIS SIGDSA/IFIP WG8.3 Symposium, December 10–11, 2016, Dublin, Ireland, pages 1–14.

- **Mansingh G.**, Osei-Bryson K.-M., Rao L. and McNaughton M. (2016). "Data Preparation: Art or Science?". In Proceedings of Third IEEE International Conference on Data Science and Engineering ICDSE, August 23–25, 2016, Kerala, India. Available on IEEE Xplore DOI**:** 10.1109/ICDSE.2016.7823936.

- **Miller, S**. and **Busby-Earle, C.** (2017). "Multi-Perspective Machine Learning A Classifier Ensemble method for intrusion detection". Proceedings of the International Conference on Machine Learning and Soft Computing (ICMLSC2017), Ho Chi Minh City, Vietnam. ACM, January 13–16, 2017, pages 1–6.

- **Miller, S**. and **Busby-Earle, C**. (2016). "The Role of Machine Learning in Botnet Detection". Proceedings of the 11th International Conference for Internet Technology and Secured Transactions (ICITST-2016), Barcelona, Spain, December 5–7, 2016, pages 1–6.

- **Uwaoma, C**. and **G. Mansingh** (2017). "On Smartphone-based Discrimination of Pathological Respiratory Sounds with Similar Acoustic Properties using Machine Learning Algorithms". In Proceedings of the14th International Conference on Informatics in Control, *Automation and Robotics* (ICINCO), Volume 1, July 26th–28th, 2017, Madrid, Spain, DOI: 10.5220/0006404604220430, pp. 422–430.

Monograph

- R. H. Feins, H. M. Burkhart, J. V. Conte, **D. N. Coore**, J. I. Fann, G. L. Hicks, N. Mokadam, J. C. Nesbitt, P. S. Ramphal, K. R. Shen, J. D. Walker (2016). "Cardiac Surgery Simulation Curriculum: Simulation-based training in surgical skills and decision making". TSDA.

Invited talks and workshops

Gunjan Mansingh

- Artificial Intelligence Demystified – From research to application. An invited talk at Jamaica Computer Society presents BizTech Talk. May 30th 2017.
- Customer Analytics – An invited talk at Jamaica Computer Society Conference, November 16–17 2016.
- Conducted a 5 day course on "The Art and Science of Data Visualization" for National Commercial Bank, December 12–16 , 2016.

PROFESSIONAL AND SCHOLARLY ACTIVITIES

Allen, Claudine

- Panel Chair for CSEC IT Syllabus Review 2017–2022.
- Reviewer: *Caribbean Educational Research Journal*, School of Education, University of the West Indies, Cave Hill Campus.

Anderson, Ricardo

- Reviewer: Knowledge Management for Research and Practice, Springer.

Busby-Earle, Curtis

- Reviewer: IET Software, Institution of Engineering and Technology; 10th International Conference on Emerging Security Information, Systems and Technologies, Nice, France.

Coore, Daniel

- Attended a 3 day Boot Camp to provide technical assistance for the use of the UWI Cardiac Surgery Simulator (UWICSS) at the 9th annual Cardiothoracic Boot Camp sponsored by the Thoracic Surgery Director's Association (TSDA).
- Reviewer: Annual workshop "Engineering Complex Adaptive Systems (eCAS)"

Ewedafe, Simon

- Reviewer: Editorial Board Member for *International Journal of Modern Computer Networks (IJMCN)*.
- International Scientific Committee and Editorial Review Board on Computer and Information Engineering.
- International Advisory Board for *International Journal of Computer Application & Applied Sciences (IJCAAS)*.
- Editorial Board Member for Science Research Association (SCIREA) Journal of Information Science and Systems Science.
- Editor for *Informatics Engineering and Information Science*

Fokum, Daniel

- Attended workshop – June 2017 JIPO/WIPO Patent Drafting Course, Jamaica Intellectual Property Office (JIPO).
- External assesor for the University Council of Jamaica (UCJ). Examined the Computer
- Proctor for IEEEXtreme Programming Competition, October 2016.
- Coach for ACM Intercollegiate Programming Competition, September–October 2016.
- Conference Reviewer: ACM Conference on Innovation and Technology in Computer Science Education, ITiCSE (2017); ACM Technical Symposium on Computing Science Education, SIGCSE (2017), IEEE SoutheastCon (2017).

Mansingh, Gunjan

Reviewer:

- Member of Editorial Review Board of *International Journal of Knowledge Management*, IGI Publishing.
- European Conference on Information Systems (ECIS), AIS Conference
- Journal – *Decision Support Systems*, Elsevier.
- Journal – *Expert Systems with Applications*, Elsevier.