

### DIRECTORATE OF RESEARCH AND GRADUATE TRAINING

### **BOOK OF DOCTORAL CITATIONS**



**DOCTORAL CONFERMENT CEREMONY** 

January 2020

### **MESSAGE FROM THE DIRECTOR**



Here it is at last – the 70<sup>th</sup> Doctoral Conferment Ceremony 2020.

To the Graduands, **Congratulations on your accomplishment**.

Today's ceremony is both the destination you have been working toward and the launching pad for your future research careers. I am genuinely proud and delighted to report that you have worked so hard to hone and perfect your skills, learning from and inspiring one another, in your diverse fields of study.

In this summary book of citations, you will find information on the key results from the different research projects undertaken. The common thread running through all of these research projects is that they apply incisive analysis to ongoing problems and unresolved issues, yielding fresh evidence and proposals for resolution. I am sure that these theses, grounded as they are in reliable data and deep analysis, will serve as important guideposts for the future. There are many studies with enticing titles that made me want to read on and learn about Makerere's research agenda. I am awed by the diversity of the fields covered, and positive that such diversity, creativity, and vision will lead to world-changing concepts and innovations.

My message to the graduands is the same: As your doctoral study programme comes to an end, it is wonderful to go down memory lane, remembering the first day you entered the gates of Makerere University, remembering all your accomplishments, remembering your Supervisors, remembering how your family stood by you, and most importantly all the wonderful friends you made through the PhD@Mak Forum!

One final thought – graduation should never mean goodbye. As alumni, I sincerely hope you will remain connected to Makerere University in some way. However, should you need further research mentorship, please do not hesitate to contact the Director via email: <u>director@rgt.mak.ac.ug</u>; Alt: buyinza@rgt.mak.ac.ug.

On behalf of all Alumni colleagues, I extend my very best wishes and warmest congratulations.

Professor Buyinza Mukadasi **DIRECTOR** 

### **TUESDAY January 14 20120**

### COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

The Principal College of Agricultural and Environmental Sciences to present the following for the conferment of the

**Conferment of Degree of Doctor of Philosophy** 

PARIYO Anthony (RIP)

### Resolution of genetic structure for resistance to cassava brown streak disease: germplasm diversity, resistance stability and inheritance patterns.

Mr. PARIYO Anthony (RIP) studied the genetic structure for resistance to cassava brown streak disease (CBSD), an acute disease that has for decades limited optimal cassava productivity in eastern and southern Africa, which is incited by cassava brown streak viruses (CBSVs). Lack of information on genetic diversity, stability and the mode of inheritance of resistance to CBSD severely limits efforts tailored towards its control. The study resulted into three principal conclusions to guide future work: 1) low frequency of CBSD resistance alleles in eastern Africa cassava germplasm; 2) different CBSD resistance gene actions for foliar and root plant parts; 3) significant environments effects, with Namulonge located in central region, being the most suitable location for CBSD resistance screening. This study was funded by the world Bank coded Millennium Science Initiative, through Government of Uganda, and was supervised by Prof. Phinehas Tukamuhabwa and Dr. Yona Baguma.

Conferment of Degree of Doctor of Philosophy



#### **ACHORA Janet Cox**

### Use of Information and Communication Technologies in conservation agriculture knowledge pathways among smallholder farmers in Machakos and Laikipia counties, Kenya

Ms. ACHORA Janet Cox examined the use of Information Communication Technologies (ICTs) in conservation agriculture knowledge pathways among smallholder farmers in Machakos and Laikipia counties, Kenya. To suggest ways in which emerging ICTs can be integrated for enhanced

conservation agriculture knowledge sharing, the study identified that the fragmented conservation agriculture knowledge network, the minor role of ICT actors in conservation agriculture knowledge sharing, the low integration of ICT tools and ICT capacities of conservation agriculture actors, constrained the optimal use of ICTs in conservation agriculture knowledge sharing. The study established that an integrated ICT knowledge sharing framework could improve and integrate the use of emerging ICTs for conservation agriculture knowledge sharing. This study was self-funded and partly supported by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), and was supervised by Dr. Haroon Sseguya and Dr. Florence Birungi Kyazze.

#### Conferment of Degree of Doctor of Philosophy



BUKUSUBA John

# Modelling the impact of stunting on childhood survival in Buhweju District and the cost of its prevention

Mr. BUKUSUBA John studied the risk factors for the high rate of stunting in Buhweju District, and modelled the impact of its reduction on child survival and the cost of interventions required. The study found half of the children under 5 years were stunted and boys were more stunted than girls. Stunting was largely attributed to low coverage of child survival interventions, morbidity, low consumption of animal-source foods, food insecurity, poverty, and lack of knowledge about stunting. The cost for the reduction of stunting was estimated at US\$ 21.2 million for the period 2018-2030, necessitating an additional US\$ 250,000 per year for scale up. The interventions and costed strategy can be adapted for the 5-year district development plan and the development of a new multi-sectoral nutrition policy and national development plan. This study was funded by Nestlé Foundation, and was supervised by Prof. Archileo N. Kaaya and Dr. Abel Atukwase.



BYAKIKA Stellah (Ms)

### Studies on the safety of Obushera and probiotic potential of selected lactic acid bacteria

Ms. BYAKIKA Stellah examined the safety of *Obushera*, a popular fermented cereal-based beverage from Uganda. This was motivated by the increasing uncontrolled commercial production of *Obushera* which compromises consumer safety. She also evaluated the potential contribution of three lactic acid bacteria isolated from *Obushera* towards improving product safety and human health. Findings showed presence of virulent, antibiotic-resistant and acid-tolerant *Escherichia coli* and aflatoxins in some *Obushera* sold in Kampala. The isolates; *Lactobacillus plantarum* MNC 21, *Lactococcus lactis* MNC 24 and *Weisella confusa* MNC 20 bound aflatoxins, inhibited *Escherichia coli* and exhibited the potential to reduce blood cholesterol, stimulate insulin release and stabilize heart pressure. Adoption of the isolates in processing of *Obushera* and related products could improve safety and health. The study was co-funded by Mr. Samuel K. Byakika and the Food Technology and Business Incubation Center, and was supervised by Assoc. Prof. Ivan Muzira Mukisa and Prof. Charles Muyanja.

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**GEBREMEDHN** Hailay Mehari

### Genetic Resistance to Soybean Rust (Phakopsora Pachyrhizi) in Line UG-5

Mr. GEBREMEDHN Hailay Mehari studied the genetic resistance to soybean rust in line UG-5. Soybean rust (SBR) is a devastative foliar diseases causing high yield losses worldwide. In Uganda, a local line UG-5 seems to have unique genes showing potential contribution towards improvement of SBR, but genetic control of its resistance is not yet characterized. The study revealed significant GCA effects and high Baker's ratio, suggesting the predominance of additive

gene action in the inheritance of SBR resistance. Three putative QTLs were identified on chromosomes 6, 9 and 18. The QTL detected on chromosome 9 was novel and has not been reported elsewhere. Plant defense signaling pathway-related candidate genes were predicted from the QTLs on chromosomes 9 and 18, which could facilitate efficient MAS and gene pyramiding for the development of durable resistance to SBR. This study was funded by INTRA-ACP Mobility Scheme, and was supervised by Prof. Phinehas Tukamuhabwa and Dr. Tomas L. Odong.

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**KIRYOWA Moses** 

### Resistance spectrum to anthracnose disease and the genetic effect of pyramided genes on yield in common bean

Mr. KIRYOWA Moses determined the pathogenic variability of *Colletotrichum lindemuthianum* (fungus causing anthracnose disease); assessed the effectiveness of pyramided resistance genes against anthracnose disease; and determined genetic effect of pyramided genes on yield in beans. *C. lindemuthianum* was highly variable with 24 new physiological races, worthy of attention. Pyramided genes in the right combination conferred broad-spectrum resistance but with a yield penalty. Some single genes conferred broad-spectrum resistance but may not be durable. The decision to pyramid resistance genes should, therefore be weighed against the threat the pathogen poses. The effective single and pyramided genes are a resource for breeders and pathologists. This study was funded by the National Agricultural Research Organization (NARO) and the International Centre for Tropical Agriculture (CIAT) -Uganda and was supervised by Prof. Phinehas Tukamuhabwa and Dr. Stanley Nkalubo.



KUMI Frank

## Studies of sorghum resistance to downy mildew (*Peronosclerospora sorghi*) disease in Uganda

Mr. KUMI Frank studied the prevalence, distribution and population structure of downy mildew disease in major sorghum growing districts in Uganda. He also characterized *Peronosclerospora sorghi* isolates which causes downy mildew disease. His study found Arua, Namutumba and Pallisa as downy mildew disease hotspots. In addition, temperature, relative humidity and rainfall were the main drivers for downy mildew epidemics. He further screened Uganda sorghum germplasm for sources of resistance to downy mildew disease under different disease pressure. Two parents and seven crosses were identified as good transmitters of resistance to downy mildew disease and are recommended as lines in a sorghum breeding programme targeting downy mildew resistance and yield improvement. This study was funded by Intra-ACP CSAA project and RUFORUM, and supervised by Prof. Patrick Rubaihayo and Dr. Moses Biruma.

# Conferment of the **Degree of Doctor of Philosophy**

#### **MIESHO Belay**

#### Genetics of cowpea resistance to bruchid (Callosobruchus maculatus Fab.)

Mr. MIESHO Belay studied Bruchids (*Callosobruchus maculatus*), which is one of the most destructive insect-pests of cowpea causing significant losses in storage. The study was designed to contribute to the reduction of cowpea storage losses through elucidation of cowpea genetics of resistance to bruchids. Through intensive phenotyping, seed biochemical and inheritance studies, four cowpea genotypes (2419, WC42, TVu-2027and IT84s-2246) resistant to bruchids were identified and recommended as donor parents for cowpea breeding against bruchids. Furthermore, eleven genomic regions and six candidate genes associated with the resistance traits were identified using genome-wide association study which could be used for marker assisted breeding. This study was funded by DAAD and Carnegie through RUFORUM; and University of California through MaRCCI; and was supervised by Prof. Patrick Rubaihayo and Prof. Samuel Kyamanyawa.

#### **MSISKA Mercy Ulemu**

#### Genetic resistance to adzuki bean bruchid in soybean

Ms. MSISKA Mercy Ulemu studied the genetic resistance to adzuki bean bruchid (*Callosobruchus chinensis*) in soybean. Utilization of resistant varieties to manage bruchids is obstructed by lack of sources of resistance and information on genetics of inheritance. Msiska's study established sources, basis and inheritance of resistance to *C. chinensis* in soybean. Two genotypes; AVRDC G8527 and PI G89 were identified as sources of resistance. High tannins, total antioxidants, peroxidase activity and low flavonoids were biochemicals associated with resistance. Potential parents in breeding for resistance were SREB-15C, S-Line 9.2 and S-Line 13.2A. Crosses of the SREB-15C x S-Line 13.2A and SREB-15C x Maksoy 3N were recommended as start up material for the breeding programme. This study was funded by Intra ACP-CSAA, APPSA and Carnegie Corporation of New York through RUFORUM, and was supervised by Prof. Phinehas Tukamuhabwa and Prof. Samuel Kyamanywa.

## Conferment of the **Degree of Doctor of Philosophy**



#### NATABIRWA Hedwig (Ms)

### Common bean (*Phaseolus vulgaris*, *L*.) extrusion cooking: process optimization and product evaluation

Ms. NATABIRWA Hedwig researched on extrusion of biofortified common beans, with focus on improving the nutritional quality of expanded starchy snack foods, commonly consumed by children. Her work showed that extruded bean product properties were associated with the bean chemical components, and influenced by the extrusion cooking conditions used. She optimized extrusion conditions, thus producing a bean snack with high protein and iron content, and improved protein digestibility. Her research proved that biofortified common beans can be used to produce highly acceptable and nutritive puffed snacks, thus promoting increased intake of macro-and micro-nutrients. The developed process provides an alternative and economically feasible extrusion processing methodology that can be used by industry for production of nutritious expanded snack products. The study was funded by the ADB-GOU HEST research corporation through CIAT and supervised by Prof. John H Muyonga and Assoc. Prof. Dorothy Nakimbugwe.

NDIRIGUE Jean

### Adaptation and genetic analysis of earliness and yield component traits of yam bean (*Pachyrhizus Spp.*) in Rwanda

Mr. NDIRIGWE Jean studied the adaptation and genetic analysis of earliness and yield component traits of yam bean (*Pachyrhizus Spp.*) in Rwanda. Yam bean, a high yielding and rich root crop in Latin America and Asia was recently introduced into Rwanda for integration into the diverse farming agro-ecologies and improvement of diets of root crop dependent communities. Ndirigwe'study identified high genetic variability, heritability and significant high general ability, specific ability and their variance components indicating that both additive and non-additive genes control earliness traits and expected genetic gain could be expected in genetic improvement of yam beans introduced. High yielding and well adapted genotypes were AC 209033, AC 209035 and EC209018 and were recommended for participatory farmer's selection. This study was funded by the Belgium Technical Cooperation, and was supervised by Prof. Phinehas Tukamuhabwa and Prof. Emeritus Patrick Rubaihayo.

# Conferment of the **Degree of Doctor of Philosophy**



### **ONYILO Francis**

# Functional genetics in ascomycetes *Pseudocercospora fijiensis* (Synonym *Mycosphaerella fijiensis*) the pathogen of black sigatoka disease in banana.

Mr. ONYILO Francis studied Functional Genetics in ascomycetes *Pseudocercospora fijiensis* (formerly *Mycosphaerella fijiensis*) the pathogen of black Sigatoka in Banana. Francis isolated and characterised Mitogen activated protein kinase encoding genes; *PfHog1, PfSlt2* and *PfFus3* which are responsible for growth and virulence of *Pseudocercospora fijiensis*. He developed an RNA interference mediated gene silencing mechanism and an *Agrobacterium tumefaciens* mediated transformation procedure to introduce genes into mycelium fragments of *Pseudocercospora fijiensis*. His research is a step towards developing banana cultivars with resistance to black Sigatoka disease. This will help increase overall banana production. Functional

genetic tools developed by Francis can be used to investigate other fungal pathogens example *Magnaporthe oryzae* of Rice. This Study was funded by Norman Borlaug Leadership Enhancement in Agricultural Programme University of California Davis USA and Agricultural Biotechnology Support programme II - USAID. His research was conducted under the mentorship of Prof. Bryce Falk and Prof. Ioannis Stergiopoulos. He was supervised by Dr. Tusiime Geoffrey and Dr. Leena Tripathi.

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OPOLOT Henry Nakelet

### Unraveling critical factors for a responsive university-farming community engagement in Uganda: insights from two outreach projects at the School of Agricultural Sciences, Makerere University

Mr. OPOLOT Henry Nakelet explored factors for development of a systematic long-term engagement framework between universities and farming communities. Findings showed that: the quality of teaching using participatory methods for development of lifelong skills; field attachment duration and appropriateness of host organizations to support practical learning; timely sharing of information; and farmers' capacity development are critical for enhancing the role of universities on agricultural development. The study recommended strengthening application of participatory teaching methods for students to develop lifelong learning skills, increasing field attachment duration in accredited organizations for enhanced practical learning, integration of ICTs for timely information sharing, and mainstreaming farmer training into outreach activities. The study also suggested introduction of a post-graduation apprenticeship as an avenue for professional skills development and long-term engagement. This study was funded by RUFORUM CARP03 Project, and was supervised by Dr. Prossy Isubikalu & Dr. Bernard Obaa.



#### ORIANGI George

#### Urban resilience to climate extremes in Mbale municipality in Eastern Uganda

Mr. Oriangi George investigated historic and projected occurrence of precipitation extremes up to the year 2050, assessed factors perceived to be influential in enhancing resilience and proposed and tested a Municipality Resilience Index (MRI) to measure household resilience to precipitation extremes in Mbale municipality. Findings revealed that extreme precipitation periods have become and are likely to become more frequent between September and January. Additionally, household ability to meet its daily expenditure needs, household size, networks with NGOs, health care, education, access to credit and employment showed to be crucial factors in enhancing resilience index (0.2). Thus, contributing to previous studies on community resilience and bear relevance for practitioners to understand where to invest more resources to enhance resilience. This study was funded by SIDA and was supervised by Assoc. Prof. Yazidhi Bamutaze, Dr. Paul Isolo Mukwaya and Prof. Petter Pilesjö.

### Conferment of the **Degree of Doctor of Philosophy**



#### WASUKIRA Arthur

### Comparative analysis of genotypic diversity among *Xanthomonas campestris* pv. musacearum and *Xanthomonas vasicola* pv. vasculorum strains

Mr. WASUKIRA Arthur conducted genome wide association studies on bacterial wilt isolates from banana, ensete and sugarcane from Eastern Africa. Bacterial wilt continues to reduce banana productivity and therefore affect livelihoods. He determined two major clades of bacterial strains within Eastern Africa, sequenced fourteen Xanthomonas strains and identified thirty-two specific candidate genes. The genome assemblies are useful in molecular dating studies, specific genetic markers used in functional, epidemiological and biogeographical research. New breeding technologies use pathogen-derived effectors as molecular probes to identify resistance genes for genetic plant protection. This study contributes to transgenic development of banana bacterial wilt resistance through gene editing. The study was funded by Millennium Science Initiative/NARO, University of Exeter, and was supervised by Dr. Geoffrey Tusiime and Dr. Jerome Kubiriba.

### **COLLEGE OF NATURAL SCIENCES**

The Principal College of Natural Sciences to present the following for the conferment of the

### **Degree of Doctor of Philosophy**



NNAMUYOMBA Proscovia (Ms)

# Biokinetics and modelling of pollutant accumulation in Cat fish (*Clarias casonii*) and Silver fish (*Rastreneobola argentea*) from selected aquatic ecosystems in Uganda

Ms. NNAMUYOMBA Proscovia's study was purposely to examine the levels of pollutants (heavy metals and DDT residues) in the two fish species and to develop a model for predicting heavy metal accumulation in Cat Fish living in contaminated environments. The current experimental methods used to determine pollutant levels are laborious and expensive, which makes it hard to generate data whenever need arises. The research established that biokinetic modelling provides an alternative cost effective method of determining pollutant levels in fish living in polluted aquatic ecosystems. The model can be used to estimate long-term metal accumulation in environmental risk assessments. This study was funded by ADB and Gulu University, and was supervised by Prof. Jolocam Mbabazi and Assoc. Prof. Muhammad Ntale.

Conferment of the

**Degree of Doctor of Philosophy** 



UWIMBABAZI Moreen (Ms)

Influence of fruit seasonality on macronutrient and energy intake and its significance on reproduction in female chimpanzees

Ms. UWIMBABAZI Moreen examined how diet-quality in terms of macronutrient content relates to the timing of reproductive events in female chimpanzees of Kibale National Park in Uganda. She found that female chimpanzees ingested more carbohydrates and lipids and reduced their foraging costs during preferred fruit abundant periods. However, they maintained stable energy intake despite the variations in diet quality through feeding behavior modifications and as such were able to breed throughout the year. The findings highlight the relevance of different food tree species in natural forest ecosystems and their significance in maintaining wild populations of chimpanzees, a specie which is threatened by forest degradation in Uganda. This study was funded by Kibale Chimpanzee Project, and was supervised by Prof. Richard Wrangham, Prof. Jessica Rothman, Assoc. Prof. Gilbert Basuta and Prof. Mnason Tweheyo.

# Conferment of the **Degree of Doctor of Philosophy**



#### WOKIYI Dennis

#### Solutions to Ill-posed Cauchy problem for a non-linear heat equation.,

Mr Wokiyi's study focused on estimating the temperature distribution below the earth's surface using temperature and heat-flux measurements on the earth's surface. The study enhanced the understanding of how temperature governs a variety of the geological processes such as; formation of magmas, minerals, fossil fuels and deformation of rocks. The candidate demonstrated that the problem is uniquely solvable under a suitable choice of function spaces and showed that numerical solutions were consistent with the existing theoretical proofs. The study was funded by International Science programme – Sweden, Makerere Staff development and Eastern Africa Universities Mathematics Programme (EAUMP). Mr Wokiyi was supervised by Prof. Vladimir Kozlov and Prof. Fredrik Berntsson from Linkoping University-Sweden, Prof. John Mango and Dr. Godwin Kakuba from Makerere University.

### **COLLEGE OF EDUCATION AND EXTERNAL STUDIES**

The Principal College of Education and External Studies to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



ATWEBEMBEIRE Juliet (Ms)

# Management practices and quality of teaching and research in private chartered universities in Uganda

Ms. ATWEBEMBEIRE Juliet examined the influence of management practices which included, staff participation, performance monitoring and staff development on quality of teaching and research in four private chartered universities in Uganda. Results demonstrated a significant contribution of staff development and staff participation on quality of teaching and research. There was no sufficient evidence to show that performance monitoring influences quality of teaching and research. The study recommended the development of more user-friendly methods of performance monitoring, giving of constructive feedback and rewarding staff basing on performance reviews. A model of shared governance was suggested for effective management of these universities. The study was funded by Uganda Management Institute, and supervised by Prof. John. Chrysostom Musaazi and Assoc. Prof. Proscovia Namubiru Ssentamu.

## Conferment of the **Degree of Doctor of Philosophy**



#### AYEBARE Justin (Ms)

# Internationalization of higher education and the global citizenship of graduate students at Makerere University

Ms. AYEBARE Justin investigated the effect of internationalization of higher education on the global citizenship of graduate students at Makerere University. This was due to the seemingly low

levels of global citizenship amongst university graduates in the country. Using the sequential explanatory research design, the study revealed that the internationalization of academic staff, curriculum, and the student community have significant positive effect on the global citizenship of graduate students. These findings reinforced the belief that the more internationalized a university is, the more likely its graduate students would become global citizens. This study presents to university managers aspects of internationalization that greatly impinge on the global citizenship of graduate students; thus, calls for significant efforts to internationalize these, and other aspects of university operations. This study was self-funded and, and was supervised by Dr. David Onen and Dr. Euzobia Mugisha Baine.

### Conferment of the **Degree of Doctor of Philosophy**



KAAHWA Yuda Taddeo

### Equity implications of the district quota and disabled students' scholarships in public universities in Uganda

Mr. KAAHWA Yuda Taddeo investigated how the district quota system and disabled students' scheme were ensuring equity at both opportunity and process of university education for the intended beneficiaries. Findings revealed that majority of students on district quota system come from low socio-economic status families, the district quota system is gender equitable, there is numerical geographical equity on district quota system; but there is geographical inequity on disabled students' scheme. The study recommends that for students to qualify for district quota system, they should have studied both primary and secondary school in that district. The percentage of district quota should be increased from 25% to 50% of government scholarships, urban districts should be excluded from district quota, and government should establish information support services for disabled students. The study was funded by Makerere University Staff Development and was supervised by Prof. Anthony Mugagga Muwagga and Assoc. Prof. Betty Ezati.



LUNYOLO Olive (Ms)

### Adapting Leech's model to explore predictors of successful doctoral student completion in Makerere University

Ms. LUNYOLO Olive explored the predictors of successful doctoral student completion (SDSC) in Makerere University. She operationalized SDSC as readiness to teach at university level, creativity, and readiness to conduct research and publish. The study isolated motivation, thinking style, self-efficacy; curriculum and standards of the program of study; the supervisor and other faculty; and the culture of the college on graduate education as predictors of SDSC. SDSC is important to the student, the university and the labour market, thus stakeholders concerned with doctoral students' issues in Makerere University should put in place strategies that enhance predictors of SDSC. The study was self-sponsored, and was supervised by Assoc. Prof. Fred Edwardus Bakkabulindi and Dr. Hilary Mukwenda Tusiime.

Conferment of the **Degree of Doctor of Philosophy** 



SSALI Kizza Francis

#### Determinants of academic staff retention in Makerere and Kyambogo Universities

Mr. SSALI Kizza Francis investigated the determinants of academic staff retention in Makerere and Kyambogo Universities. This was due to the persistent low levels of academic staff retention reported in the two universities in recent times. Using the descriptive cross-sectional survey design, gender, terms of work and work life balance were found to enhance the retention of academic staff more than their marital status, age, work experience, and interpersonal relationships. Therefore, it was concluded that certain factors were more critical than others in determining the retention of academic staff. It was, thus, recommended that the management of the two universities should engender policies that can improve the terms of work and promote optimal work-life balance amongst academic staff. The study was self-sponsored and was supervised by Dr. David Onen and Dr. Genza Gyaviira Musoke.

### **COLLEGE OF HEALTH SCIENCES**

The Principal College of Health Sciences to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



**BBOSA** Nicholas

### A molecular phylogenetic and modelling approach towards understanding the transmission dynamics and genetic diversity of HIV-1 in the fishing communities of Lake Victoria, Uganda

Dr. BBOSA Nicholas used molecular phylogenetic and modelling approaches to dissect the transmission dynamics of HIV in the fishing communities of Lake Victoria. The fishing communities are disproportionately affected by HIV relative to the general population and for a long time, the dynamics of HIV transmission were not well understood. His research revealed for the first time in Uganda that the fishing communities were a sink for HIV transmission from the general population and negated the generally held assumption of the fishing communities being viral reservoirs. The findings have contributed towards informing public health policies on the implementation of targeted interventions for effective HIV epidemic control in most at-risk populations. This study was funded by the UK Medical research council, and was supervised by Prof. Pontiano Kaleebu, Prof. Andrew Leigh-Brown, Dr. Bernard S. Bagaya, Assoc. Prof Noah Kiwanuka and Dr. Rebecca N. Nsubuga.

Conferment of the Degree of Doctor of Philosophy



**BWIRE Godfrey** 

Molecular characterization and rapid detection of *Vibrio cholerae* in Uganda: the relationship between human pathogens and aquatic environment.

Dr. BWIRE Godfrey studied *Vibrio cholerae*, the bacteria responsible for repeated cholera outbreaks in Uganda to determine their genetic profile, spread, transmission, virulence, aquatic environmental reservoirs and a field cholera rapid diagnostic test (RDT). The study found that cholera outbreaks in Uganda were due to three genetically related *V. cholerae* clones. The clones showed transmission within Uganda, East and Central African regions. The surface water sources in Uganda were possibly not reservoirs for the epidemic *V. cholerae*. The accuracy of the cholera RDT, a modified *Crystal VC*<sup>®</sup> dipsticks was high. This study enhances our understanding of cholera outbreaks and may help in prevention, control and elimination of cholera in Uganda. The study was jointly funded by the Uganda Ministry of Health and Bill and Melinda Gates Foundation (USA) and supervised by Prof. Christopher Garimoi Orach (MakSPH) and Prof. David Allen Sack (John Hopkins University, USA).

## Conferment of the **Degree of Doctor of Philosophy**



EGESA Moses

#### Human B and T cell responses to novel Schistosoma mansoni skin-stage antigens

Mr. EGESA Moses studied human immune responses to parasite components expressed at the vulnerable skin larva stage of the human blood fluke, *Schistosoma*. It was not known how endemic populations respond to recombinant components of the larvae and how these immune responses relate with intensity of infection when people get re-infected. The recombinant antigens induced inflammatory cytokine responses. Additionally, antibodies to these antigens were detectable and were affected by treatment. Although not associated with reinfection intensity, the information generated informs the selection and prioritization of vaccine targets. This study was funded by a Wellcome Trust Strategic Award and the DELTAS Africa Initiative and supported by European Commission's Seventh Framework Programme, and was supervised by Dr. Bernard Bagaya, Prof. Maria Yazdanbakhsh and Dr. Stephen Cose.



KADDUMUKASA. Martin

# Sodium intake in post-stroke patients – its influence on blood pressure, knowledge and perceptions and stroke outcomes in Uganda

Dr. KADDUMUKASA Martin's thesis focuses on salt intake and cardiovascular stroke. He estimates the daily intake and its association with blood pressure and stroke. He further investigates knowledge, perceptions, and consumption decisions after stroke. He uses 24-hour urine to determine the salt intake in stroke patients. He notes that stroke survivors with high blood pressure have twice the levels of salt compared to stroke survivors without blood pressure. Poor knowledge, perceptions, and salt use beliefs. Finally a high frequency of stroke recurrence and death was observed in this group. This study recommends primary stroke prevention through salt intake reduction and population salt awareness through education. This study was supported by NIH MEPI-linked Neurology Award (No. 5R24TW008886), Fogarty International Centre and was supervised by Prof. E. Katabira, Prof. Martha Sajatovic, Prof. Larry Goldstein and Dr.Pundik.

### Conferment of the **Degree of Doctor of Philosophy**



**KAYIMA** James

#### Hypertension in Uganda: epidemiology and association with HIV infection and genetics

Dr. KAYIMA James investigated the association of HIV infection and selected genes with blood pressure traits among Ugandans. He observed that, unlike the western populations, the frequency of hypertension was lower among HIV-infected compared to uninfected subjects in Uganda. Further, he uncovered the profound negative effect of SUB/NPR3 gene on systolic blood pressure. These finding suggest a protective effect of HIV on hypertension; and a potential modifying effect of SUB/NPR3 gene on hypertension in African populations. This work elucidates the role of HIV and population-specific genetic factors in the control of hypertension risk. It builds a foundation for formulation of prevention efforts for cardiovascular disease among high-risk groups; and for

pharmacogenetic studies to identify appropriate medication for hypertensive black populations. This study was funded by Medical Education Partnership Initiative on Cardiovascular Disease (MEPI-CVD), and was supervised by Dr. Achilles Katamba, Prof. Harriet Mayanja Kizza, Prof. Xiaofeng Zhu and Prof. Mahboob Rahman.

Conferment of the **Degree of Doctor of Philosophy** 



MBOOWA Gerald

### Functional host-genetic loci associated with pediatric HIV-disease progression in Uganda and Botswana

Dr. MBOOWA Gerald used genomics and bioinformatics approaches to identify a set of genes that informs us which person if HIV-infected will take many years to develop AIDS (symptoms) without HIV-treatment. His research revealed that following HIV infection, there are two groups of people; Rapid-AIDS progressors (develop symptoms in 3-years or less after infection) and Long-term non-progressors (>10-years to develop symptoms) without HIV-treatment. These findings have implications for the current "Test-and-Treat and Treat-for-Life" HIV-treatment policy; when one tests HIV-positive and started on treatment-for-life exposing them to drugs' dangerous side-effects yet some HIV-infected people have nature ability to stay for many years without developing symptoms in absence of HIV-treatment. This study was funded by the Collaborative African Genomics Network-(CAfGEN) and Training Health Researchers into Vocational Excellence in East Africa-(THRiVE-2), and supervised by Prof Moses Joloba and Dr. David Kateete.

Conferment of the **Degree of Doctor of Philosophy** 



MPIMBAZA Arthur Mwambari

Determinants of severe malaria among children hospitalised at Jinja Regional Referral Hospital, Uganda

Dr. MPIMBAZA Arthur Mwambari studied determinants of severe malaria among children in the Busoga sub-region. Risk factors for severe malaria included delayed care seeking by more than 24 hours after fever onset and seeking care at a drug shop as the initial response. For convenience, drug shops were the most common provider sought by caregivers of children with severe malaria. However, drug shops offered sub-optimal healthcare services compared to public health facilities. Hemoglobin S heterozygotes, alpha thalassemia heterozygosity and homozygosity were associated with protection against severe malaria. Drug shops were a problem, contributing to delay and severe malaria. The role of drug shops in caring for children with malaria needs to be re-evaluated and services at public health facilities strengthened. This study was funded by NIH Fogarty International Center (TW009343 and TW007375) and was supervised by Assoc. Prof. Charles Karamagi, Prof. Anne Katahoire, Grace Ndeezi and Philip J Rosenthal.

### Conferment of the **Degree of Doctor of Philosophy**



NABATANZI Rose (Ms)

### Innate immune system recovery after long-term antiretroviral therapy in an African cohort

Dr. NABATANZI Rose studied whether key blood cell populations of HIV infected adults recover completely after at least seven years of treatment with antiretroviral therapy (ART). This research found that despite at least seven years of effective ART, key first line defence cells among HIV-infected individuals were still fewer and produced low chemical mediators of first line defence against invading germs; compared with age-matched healthy HIV uninfected individuals. More emphasis should be put on ways of improving the body's defence system for individuals on long-term ART to levels comparable to HIV-uninfected individuals, to prevent or delay HIV-associated complications among adults aging with the disease. This study was funded by DELTAS Africa Initiative, the Wellcome Trust and UK government and Alliance for Global Health and Science at University of California, Berkeley, USA; and was supervised by Prof. Damalie Nakanjako, Prof. Moses Joloba, Prof. Stephen Cose and Prof. Sarah Rowland Jones.



### NAJJUKA Christine Florence (Ms)

# Characterisation of extended spectrum Beta lactamases elaborated in Enterobactereaceae in Uganda

Dr. NAJJUKA Christine Florence investigated the prevalence of Extended Spectrum beta-Lactamases (ESBLs), the factors associated with gastrointestinal carriage, genotypes, transmission dynamics and co-resistance among clients attending outpatient clinics in Kampala, Kayunga and Mpigi Districts. She found predominance of cefotaximase in Kampala and presence of plasmidmediated AmpC beta-lactamase genes, especially in ceftriaxone-susceptible *Escherichia coli*. Use of ciprofloxacin, inoculation and routine health follow up were risk factors, while rural residency and visiting lower health centres were protective of carriage of resistant bacteria. Transmission was predominantly by horizontal gene transfer of cefotaximase with at least two non-beta-lactam resistance genes. The findings inform widespread gut colonisation by bacteria resistant to 3<sup>rd</sup> generation cephalosporins and commonly used non beta-lactam agents, a source for transmission and infection with unpredictable and limited treatment options. This study was funded by Sida-Makerere Bilateral Research Programme and the Carnegie Cooperation of New York, and was supervised by Prof. Moses L. Joloba and Prof. Sabiha Y. Essack.

### Conferment of the **Degree of Doctor of Philosophy**



ZIDA Andre

Creating and institutionalizing supports for evidence-informed decision making, including a rapid response service, in the Burkina Faso health system

Dr. ZIDA Andre's research focused on decision making in the Burkina Faso health system. His investigation focused on the institutionalization of a policy support unit called rapid response to provide evidence for urgent decision-making. The study showed that the institutionalization of decision support units demands a robust framework and political will. It can be non-linear, and it depends on the leadership of unit managers to implement relevant activities, mobilize funding, and recruit and maintain sufficient human resources. This study developed a clear roadmap for evidence-informed decision-making and policy unit institutionalization. This study was funded by International Development Research Centre (IDRC) and the European Union, and was supervised by Prof. Nelson K. Sewankambo, John N. Lavis and Dr. Bocar Kouyate.

### WEDNESDAY January 15 2020

### **COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES**

The Principal College of Business and Management Sciences to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



MANIRAGABA Fred

#### Determinants of quality of life of older persons in rural Uganda

Mr. Fred Maniragaba investigated the determinants of quality of life of older persons in rural Uganda. In this study, quality of life focused on physical health, intimacy, and social participation dimensions. The findings show that more than 3 in 10 older persons had low scores on social participation, intimacy and physical health. Overall, 4 in every 10 older persons had poor quality of life. The distribution of poor quality of life varied by sex, wealth status, region of residence, education, engagement in physical activity and HIV sero-status. The study recommended that older persons should be economically empowered, included in HIV prevention interventions such as safe sex education, embrace active ageing; and educated ones should be encouraged to participate in community social engagements. This study was funded by Makerere University and Consortium for Advanced Research and Training in Africa (CARTA). It was supervised by Dr. Betty Kwagala and Professor James Ntozi.



TURYAREEBA Dickson

#### The Augmented Solow Growth Model, Total Factor Productivity Growth and the Cross-Country Income Growth Disparities in Africa

Mr. Turyareeba Dickson's study was purposely to make a scholarly contribution to the growth accounting debate on the relative importance of factor accumulation and total factor productivity growth in explaining cross-country differences in income growth in Africa. His study found that differences in both factor accumulation and total factor productivity growth can explain the cross-country differences in income growth in Africa. His study results however showed that differences in factor accumulation played a more important role than differences total factor productivity growth in explaining growth disparities in Africa and in the clusters. Mr. Turyareeba Dickson's study revealed that to spur more economic growth in Africa, there is the need for governments to design policies that boost gross capital formation; earmark extra resources for human capital development and for increased investment in ICT infrastructure; create incentives for credit expansion to the private sector and devise stronger policies against inflation. To foster economic growth in Sub-Saharan Africa, results showed that governments need to increase investments in ICT infrastructure, implement outward-looking development strategies, expand credit to the private sector and implement population growth control measures. The study was self-funded and supervised by Associate Professors: Eseza Kateregga and Elia Hisali.

### **COLLEGE OF COMPUTING AND INFORMATION SCIENCES**

The Principal College of Computing and Information Sciences to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



ADUWO Jennifer Rose (Ms)

### A Machine Learning Model for Automatic Field Based Classification of Cassava Mosaic Disease and its Severity

Ms. ADUWO Jennifer Rose investigated how machine learning can be used for detection of cassava mosaic disease (CMD) and its severity using field based cassava leaf images. The study employed an experimental design. A total of 340 healthy and 313 CMD infected cassava leaf images were collected from National Crops Resources Research Institute (NaCRRI), Uganda for the experiments. The developed machine learning Artificial Neural Network model provided accuracy rate of 97.2% for CMD classification and 88% for CMD severity grading. Within the model, CMD classification including its severity could be implemented on a mobile phone. In terms of policy, NaCRRI could spearhead the development of a policy on integration of machine learning in CMD management and engagement of Agricultural Extension Workers to detect CMD and its severity using the developed model. This study was self-funded and supervised by Dr. Joyce Nakatumba Nabende and Dr. Ernest Mwebaze.

### **Conferment of**

**Degree of Doctor of Philosophy** 



KABURU Dennis Mugambi

#### An adjustable usable security approach for a continuous user authentication scheme

Mr. KABURU Dennis research developed an adjustable usable security approach that enhances the alignment of security and usability attributes to achieve a better interaction in continuous user authentication schemes. He established that software developers have neglected the effect of the authentication approaches on the cognitive processes of a user, resulting into not user-friendly systems. Through experiments, the resultant approach showed a threshold that adjusts user interactions at different times and a technique that quantitatively recommends combinations that minimize the cognitive load and usability deficiency. Software developers can use this approach as a platform that enables their reasoning of how their use of authentication mechanisms affects end user efficiency and make refined decisions that improve usability of user interactions in a continuous authentication scheme. This study was funded by METEGA, and was supervised by Dr. Julianne Sansa–Otim and Dr. Tony Bulega.

### Conferment of the **Degree of Doctor of Philosophy**



MASABO Emmanuel

### Integrated feature engineering approach for classification and detection of polymorphic malware using machine learning

Mr. MASABO Emmanuel's research focused on the security of computer systems, by investigating the challenges related to the eradication of malware. The study showed that poor detection of current malware by existing technologies is due to polymorphism in today's malware, which enables them to disguise themselves by creating infinite number of new variants of themselves in order to evade detection systems. This study developed a new machine learning approach to effectively address the aforementioned problem. The findings showed improved performance both in terms of classification and detection of polymorphic malware. This study was

funded by Metega, and was supervised by Dr. Kyanda Swaib Kaawaase and Dr. Julianne Sansa Otim.

### Conferment of the **Degree of Doctor of Philosophy**



NAKIBUULE Rose (Ms)

### Traffic flow speed and congestion monitoring in resource-constrained crowded cities

Ms. NAKIBUULE Rose's study was to develop a low cost collection tool and computer vision based computation models for monitoring traffic flow speed and congestion levels of unstructured traffic flow found in resource-constrained crowded cities. Current computer vision methods tailored for traffic flow speed and congestion monitoring are costly and computationally expensive. The study revealed that by assembling a set of off-the-shelf hardware components and programming smartphone cameras as automatic image sensors reduce data acquisition costs by 80% as compared to conventional closed circuit televisions (CCTVs). The study developed a tool for real-time traffic flow monitoring and data acquisition. This study was funded by NUFFIC, DAAD, and College of Computing and Information Sciences, and was supervised by Dr. John Alexander Quinn, Dr. Ernest Mwebaze and Dr. Joyce Nakatumba-Nabende

## Conferment of the **Degree of Doctor of Philosophy**



NINA Olivia (Ms)

# Indigenous knowledge utilization strategies for HIV prevention in Uganda: a study of secondary school adolescents, Kampala District

Ms. NINA Olivia investigated approaches for enhancing use of Indigenous Knowledge (IK) in the context of Human Immunodeficiency Virus (HIV) prevention among adolescents. Prevention programs that blended biomedical and IK were known to be more successful than those that did

not. With increasing HIV infections among adolescents, promoting combination of approaches was critical to increasing access to accurate comprehensive information. However, existing national guidelines on use of IK were limited, fragmented and their implementation was not yet clear. The study revealed that the IK information being used contained misinformation. Ties between IK sources and adolescents were too weak to support IK use. The study recommended development of a specific national IK school health policy. Synergies between indigenous information sources and adolescents needed to be strengthened and documented IK integrated into existing HIV prevention information. This study was self-sponsored, and was supervised by Assoc. Prof. Ruth Nalumaga and Prof. Robert Ikoja-Odongo.

## Conferment of the **Degree of Doctor of Philosophy**



### OMODA-ONYAIT Godfrey

#### A model for personalizing learning in an E-learning System

Mr. OMODA-ONYAIT Godfrey's research investigated the requirements for personalizing learning in an e-learning system to address the issue of learner diversity and changing learner needs. A survey was conducted to gather requirements for the model using questionnaires and interviews. The findings were used to develop the model. Model evaluation was done using experts, and prototyping; and the model was found suitable. The following factors were established for determining personalized learning: learner commitment; learner motivation; learner engagement; and learner experience. From a practical point of view, the results provided a generic model that can help practitioners and policy makers in personalizing and implementing learning in an e-learning system, hence addressing learner diversity and their changing needs. This study was self-funded, and was supervised by Prof. Jude T. Lubega and Assoc. Prof. Gilbert Mayiga.

### COLLEGE OF VETERINARY MEDICINE, ANIMAL RESOURCES AND BIO-SECURITY

The Principal College of Veterinary Medicine, Animal Resources and Bio-security to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



YAJJ Nuol Aywel Madut

# Brucellosis at human-domestic animal interface in Greater Bahr el Ghazal States, South Sudan

Mr YAJJ Nuol Aywel Madut assessed the prevalence of brucellosis among humans and domestic animals in pastoral settings in post-conflict Greater Bahr el Ghazal States, South Sudan. Brucellosis prevalence was high both in human and animals due to the lack of control measures and awareness and the disease was common among febrile patients attending out patient department (OPD) in Wau Hospital. The consumption of infected animal products played a major role in transmission of brucellosis. Age, herd size, lactation, health status, hygroma and history of abortion were factors associated with the infection. There is need for mandatory routine testing for brucellosis among herders and other high-risk groups, and control should be accomplished at the animal level since people have a social and cultural tendency to consume raw animal products. This study was funded by NORHED and was supervised by Assoc. Prof. George William Nasinyama and Assoc. Prof. Clovice Kankya.

### **THURSDAY January 15 2020**

### MAKERERE UNIVERSITY BUSINESS SCHOOL

The Principal Makerere University Business School to present the following for the conferment of the

#### **Degree of Doctor of Philosophy**



KAWALYA Charles Happiness at workplace

Mr. KAWALYA Charles investigated the personal factors associated with happiness at the workplace among professional nurses from public Hospitals in Uganda. In light of today's turbulent work environment, happiness at the workplace is essential for increased productivity. This study found that psychological needs satisfaction (*relatedness, competence*), psychological capital (*resilience, hope*), self-driven personality (*extroversion*) and flow experience (*challenge skill balance, concentration on the tasks*) are important factors that influence happiness at the workplace. Most importantly, the results confirmed the mediation effect of flow experience in these relationships. Government, especially the ministries of Ministry of Health, Public Service and Human Resource Managers, should consider coming up with a policy on the science of happiness at the workplace. The study was funded by Makerere University Business School, and was supervised by Prof. John Munene and Dr. Sam Mafabi.



LUBOGOYI Bumaali

### **Employee Goal Congruence in the District Local Governments of Government**

Mr. LUBOGOYI Bumaali studied the employee goal congruence as a strategy for production of goods and services that match the needs interest and preferences of the citizenry. Despite public sector reforms such as decentralization, democratic governance and capacity building programs and increased financial support employees have not been able to fully realize district mandate due to diverse interests of multiple actors. A mixed research methodology was employed which explained 46% of the variance in Goal congruence. The study revealed that stewardship behavior, ethical culture and collectivism are key in public sector change, transformation and development. This implies that district managers need to pay greater attention to goal congruence as they grapple with strategies for development. This study was funded by African development Bank and Makerere University Business School.

# Conferment of the **Degree of Doctor of Philosophy**



#### MUTUMBA Abbey

## Franchising Readiness in a Developing Country: A Study of Potential Franchisors in Uganda

Mr. MUTUMBA Abbey's study focused on franchising values, public-private-partnership (PPP) support and the entrepreneurial ecosystem quality contribute to franchising readiness among the authorized distributors, master agents and multi-branch enterprises among other potential

franchisors. The model revealed that complementary proactiveness and innovativeness, PPP support and entrepreneurial ecosystem quality determine the franchising readiness in Uganda. In addition, the potential franchisors that worked with the policy makers, local leaders, universities and media developed into homegrown franchisors by 2019. Consequently, more world-class knowledge, technology and skills transfer/exchange, jobs and wealth creation are being contributed as the potential franchisors open up more branches through more locally-appointed franchisees. Therefore, Uganda's BUBU policy and industrial parks-allocation policy should favor the more community-engaged potential franchisors. This study was funded by AfDB and MUBS, and was supervised by Prof. John C. Munene, Prof. Joseph Ntayi, and Prof. Mohammad Ngoma

### Conferment of the **Degree of Doctor of Philosophy**



MAYANJA Samuel

# Entrepreneurial networking among Small and Medium Enterprises: the role of nexus of generative influence, positive deviance, informational differences and ecologies of innovation in Uganda

Mr. MAYANJA Samuel studied the determinants of entrepreneurial networking among Small and Medium Enterprises (SMEs) in Uganda. The findings revealed that entrepreneurial opportunity, nexus of generative influence, ecologies of innovation and informational differences explain entrepreneurial networking of SMEs. One the other hand, positive deviant employees cannot access resources on their own without the support of business owner/manager. Therefore, business owners and employees at all levels should support idea generation through experimentation with learning in mind and adaptability readiness. These would create enabling environment for SMEs to access formal and informal resources from their social networks to overcome the liability of smallness. The study was self-funded, and was supervised by Prof. John Munene, Prof. Waswa Balunywa, and Prof. Joseph Ntayi.



**MWESIGWA** Rogers

#### Stakeholder management in public private partnership projects in Uganda

Mr. MWESIGWA Rogers investigated the predictors of stakeholder management in public private partnership (PPP) projects in Uganda; focusing on the relationship between stakeholder behavior, contract completeness, stakeholder attributes, relationship building and stakeholder management. The study found that stakeholder behavior and relationship building are associated with stakeholder management, while contract completeness and stakeholder attributes are negatively associated with stakeholder management. Relationship building partially mediated stakeholder behavior, contract completeness with stakeholder management. Therefore PPP projects need to build strong stakeholder relationships, understand their behavior and attributes; and manage contracts in order to manage stakeholders' interests and expectations. There is need for contract monitoring and enforcement mechanism and capacity building among line ministries involved in contract negotiation so that contracts are enforceable. The study was funded by African Development Bank and Makerere University Business School, and was supervised by Prof. John Chrysostom Munene, Prof. Joseph Ntayi and Assoc. Prof Vincent Bagire.

### Conferment of the **Degree of Doctor of Philosophy**



**OMEKE** Michael

#### Dynamics of Enterprise growth of Savings and Credit Cooperatives (SACCOs) in Uganda

Mr. OMEKE Michael studied the growth of Savings and Credit Cooperatives (SACCOs) as socioenterprises using a multi-theoretical approach. The findings revealed that re-organizing and renewing resources, exchange and sharing of resources and information, self-organizing and adaptive behaviour explain the growth of SACCOs. On the other hand, laws, rules, standards and shared beliefs alone do not necessarily contribute to the growth of SACCOs. Therefore, SACCOs should adopt modern technological applications, build capacity of staff and members, share and exchange knowledge, skills and experiences, self-organize themselves and adjust to the ever changing demands in the dynamic environment. The study was funded by Kyambogo University and supervised by Prof. Pascal Tindi Ngoboka, Dr. Isaac Nabeta Nkote and Dr. Isaac Newton Kayongo.

Conferment of the **Degree of Doctor of Philosophy** 



**ONYINYI Benard** 

#### Quality management practices among small and medium scale enterprises in Uganda

Mr. OYINYI Benard's study examined quality management practices among Small and Medium Scale Enterprises (SMEs) in Uganda. The study revealed that knowledge management potential is positively and significantly related to quality management practices among SMEs. Besides, resource transformation capabilities positively and significantly predict quality management practices and there exists a positive and significant relationship between benchmarking competency and quality management practices among SMEs. Further, the effect of knowledge management potential on quality management practices varies with the level of ICT robustness. Therefore, government should design framework policies to guide SME management in knowledge management, resource transformation and benchmarking competencies in the ICT dominated environment to support them adopt ideal quality management practices in the current competitive business environment. This study was funded by Makerere University Business School, and was supervised by Prof. Will Kaberuka and Dr. Nichodemus Rudaheranwa.

### FRIDAY January 17 2020

### **COLLEGE OF ENGINEERING, DESIGN, ART, AND TECHNOLOGY**

The Principal College of Engineering, Design, Art and Technology to present the following for the conferment of the

Degree of Doctor of Philosophy



#### **BAKYAYITA Grace Kizito**

### Batch Sorption Studies of Aqueous Cadmium and Lead from contaminated Water onto Selected Biosorbents

Mr. Bakyayita Grace Kizito's study focussed on assessment of groundwater and surface water from Lake Victoria basin, Uganda and batch remediation of cadmium and lead from contaminated water using biosorbents. He used the Biomet tool and potential risks to toxicity effects of  $Cu^{2+}$ ,  $Ni^{2+}$ ,  $Zn^{2+}$  and  $Pb^{2+}$  in the surface water and groundwater studied. He characterized selected biosorbents and he used models to deduce optimal operating conditions, interionic competition effects, uptake kinetics and mechanisms. He concluded that both untreated and treated biosorbents from *Albizia coriaria*, *Coffea canephora*, *Cyperus papyrus*, *Erythrina abyssinica* and *Musa spp* were potential alternative materials for uptake of trace metals from contaminated water. This knowledge will benefit the design of fixed bed reactors for biosorption of trace metals from contaminated water. He recommends detailed risk assessment of water sources and pilot applications for biosorbents. This study was funded by Sida-Makerere Bilateral Research Corporation (Phase 3) and was supervised by Associate Professor Ann-Catrine Norrström and Dr. Robinah Kulabako N.



**MENYA** Emmanuel

# Preparation and Evaluation of Activated Carbons from Rice Husks in Uganda for Removal of Humic Acid from Water

Mr. Menya Emmanuel developed an optimum route for valorization of rice husks into activated carbon to address the disposal problem of rice husks, as well as to provide a sustainable solution for removal of humic acid from water. His study revealed that upland rice husk varieties are more suitable precursors for activated carbon than lowland varieties. By alkaline pretreatment of the rice husks, followed by phosphoric acid (30wt%) impregnation, and activation at 400 °C for 30 min, activated carbons with a carbon yield and total specific surface area as high as 46.9% and 2258.4 m<sup>2</sup>g<sup>-1</sup>, respectively, were obtained. The study further revealed that, humic acid removal efficiency and maximum adsorption capacity of 69.23% and 27.2 mgg<sup>-1</sup>, respectively, can be obtained by employing the rice husk-derived activated carbons in water treatment. The adsorptive properties, and consequently the performance of the resultant activated carbons were comparable to those of the activated carbons found on the market. The findings of this study pave way for utilizing rice husks in Uganda as activated carbon precursors, avoiding the environmental problems associated with the open dumping and/or burning of rice husks, while at the same time providing a sustainable solution for water treatment. This study was funded by the Volkswagen Foundation, and was supervised by Dr. Peter W. Olupot, Dr. Henning Storz, and Dr. Michael Lubwama.



**KEKIMURI** Joan (Ms)

#### Embedded meanings of traditional art forms in cultural practices of Baganda

Ms. KEKIMURI Joan's study focused on the meanings embedded in traditional art forms used in Baganda cultural practices. Art forms play a pivotal role in strengthening community connections yet modern technological advances threaten their existence. Using ethnography and benchmarking the theory of culture and behavior, Kekimuri through visual narratives established how traditional art forms used in Baganda cultural practices developed, examined their embedded meanings, and the influence of modernization on these practices. The findings revealed that the embedded meanings in cultural practices enabled communities to function, that modernization hampers the use of cultural practices, and communities are forsaking the practices for modern ideologies. This study recommended support of indigenous practices for cultural identity and posterity. The study was funded by Kyambogo University, and was supervised by Assoc. Prof. Kizito Maria Kasule and Prof. Baguma Peter.

### **COLLEGE OF HUMANITIES AND SOCIAL SCIENCES**

The Principal College of Humanities and Social Sciences to present the following for the conferment of the

#### **Degree of Doctorate of Philosophy**



JOCK BANY MADING Samuel

#### The role of religion in conflict and peace in Sudan: a historical perspective (1989-2011)

Mr. JOCK BANY MADING Samuel's research examined the religious conflict, which had divided the Sudan citizens between Muslims and non-Muslims, Arab and non-Arabs and subsequently resulted in division of the largest country in Africa into Sudan and South Sudan. The islamization program which became a rigid ideology in the Sudanese leadership caused sanction against the country, regionally and internationally, and made a great economic setback. The study found fear that if the Sudanese leadership continues with such an ideology, it may lead other parts that feel marginalized politically, economically and ethnically to continue demanding for similar criteria as the South. The research findings implore the Sudanese leadership to change the one-sided ideological program in order to reform the social integration and development. This study was self funded, and was supervised by Dr. Catherine Jendia and Dr. Paddy Musana.

## Conferment of the **Degree of Doctor of Philosophy**



MUGAMBE Mpiima David

## Gender relations in the access to and use of mobile phones and radios in agricultural production in Apac District, northern Uganda

Mr. MUGAMBE Mpiima David investigated the gender relations in the access to and use of mobile phones and radios in agricultural production in Apac District. Gender relations were found to mediate mobile phones and radios uptake. Farmers using agricultural information from these technologies experienced positive changes in gender power relations, gender roles, social status and incomes. The study recommended that technological interventions should be sensitive to interactions between men and women, and that agricultural extension officers should be sensitized

on gender relations so that men and women can fully benefit from agricultural interventions. This study was funded by Makerere-Sida Bilateral Research Corporation, and was supervised by Dr. Henry Manyire, Assoc. Prof. Consolata Kabonesa and Dr. Margareta Espling.

Conferment of the **Degree of Doctor of Philosophy** 



NAJJEMBA Harriet (Ms)

# Indigenous agricultural knowledge and food production in Uganda: Buganda region from 1860s to 1997

Ms NAJJEMBA Harriet's research analysed why some indigenous agricultural practices have become resilient and still inform crop production despite western scientific agricultural knowledge. She found that mulching reduces moisture loss, curbs weed growth and provides organic manure thus reducing effects of climate change. Intercropping, crop rotation, paspalum bunding, catch-pits, and fallowing maintain soil fertility. Select agricultural machinery aligned to tropics, topography and soil type enhances crop yields. The research established that these indigenous practices are still relevant and affordable, and NARO needs to deliberately encourage their use. This study was funded by Carnegie Corporation of New York through the NGAA Project and the African Humanities Programme (AHP), and was supervised by Dr. Simon Peter Rutabajuuka and Dr. Deo Katono Nzarwa.

### Conferment of the **Degree of Doctor of Philosophy**



NAKANGU Bugembe Barbara (Ms)

### State Craft in the Natural Resources Management Structure of Uganda

Ms. NAKANGU Bugembe Barbara examined the historical and political circumstances in which the natural resources management structures were established. Nakangu situated the natural resource management within the political context of successive post-colonial regimes. Reforms in natural resource management link to the political orientation of various governments especially their ideas on the management of society. Nakangu showed why attempts at strengthening the resource management structures by the NRM government were unable to address the ecological challenges. Ecological disasters arose at moments when there was imbalance of power between the state or society. Conservation actors needed to re-establish the balance of power between the state and the society to address the declining ecological conditions. This study was funded by Norhed and Carnegie through Makerere Institute of Social Research, and was supervised by Dr. Lyn Ossome.

### Conferment of the **Degree of Doctor of Philosophy**



#### **ODONGOH Stevens Aguto**

### Polluted boundaries, contested sociality: tracing the Acholi homestead after LRA war and displacement in northern Uganda

Mr. ODONGOH Stevens Aguto demonstrated an understanding of borders/boundaries beyond the usual territorial or geographical perspective. By exploring the return of displaced Acholi people to post-conflict Acholi sub-region in northern Uganda, he argued that: When the Acholi who were held captives by the Lord's Resistance Army (LRA), or were living in exile returned and society accepted them, in a sense, they were socially received but had to ritually or religiously cross different boundaries to regain belonging and sociality. Crossing such boundaries led to contestations of gender roles, identity and values. His analysis offers perspectives on resettling returnees, the human need for boundaries or separate themselves in periods of uncertainty. This study was funded by NORHED under the Borderlands Dynamics Project of East Africa, and was supervised by Dr. Wotsuna Khamalwa and Dr. Andrew Ellias State.



#### **OPESEN** Chris Columbus

### Trans-border cultural and reproductive health traditions: an ethnographic study of the Pokot female genital modifications at the Kenya-Uganda-Border

Mr. OPESEN Chris Columbus examined the lived experiences of women with trans-border cultural and reproductive health (CRH) traditions using female genital modifications (FGM) at the Pokot Kenya-Uganda border as his ethnographic case. Based on the inductive analysis he conducted, he observed that one's experience with cultural and reproductive health traditions like FGM is an outcome of many factors including the nature of tradition undergone, the technology used, the skillfulness and experience of the surgeon. Notwithstanding, some exceptions, he argued that the life-long experiences of women that undergo extreme CRH traditions like FGM especially, infibulation, are synonymous with pain, violence and risk. To successfully eliminate FGM, he recommends supporting the current FGM-law enforcement with a soft approach targeting the software of this tradition using meaningful stakeholder engagements. This study was funded by the NORAD East African Borderlands Project, and was supervised by Assoc. Prof. Stella Neema and Dr. Fred Henry Bateganya

## Conferment of the **Degree of Doctor of Philosophy**



WELDESENBET Netsanet Gebremichael (Ms)

#### Topographies of reminiscences: Asmara as historical representations and deliberations

Ms. WELDESENBET Netsanet Gebremichael examined "neither war nor peace" (1998-2016) moment of historico-political raptures between Eritrea and Ethiopia from reminisces of Asmara - the capital city of Eritrea from Ethiopia in what appears to be a moment of rift. Foregrounding a context of non-movement, the dissertation asked: what happens to conventional historical methods in a moment of raptures? The dissertation opened methodological possibilities on how history could be done in moments of rift by mobilizing popular memory productions in form of oral-accounts with popular cultural productions such as autobiographies, memoirs, songs, novels and poetry. These reminiscing practices were conceptualized deliberations on popular political desires

of the present. These accounts can further inform going peace-building efforts between the two countries. This study was funded by Carnegie through Makerere Institute of Social Research, and was supervised by Prof. Mahmood Mamdani.

### **SCHOOL OF LAW**

The Principal School of Law to present the following for the conferment of the

#### **Degree of Doctor of Laws**



TUSASIRWE Benson

# The judicial enforcement of the rights to freedom of political assembly and association in Uganda

Mr. TUSASIRWE Benson investigated the state of rights to freedom of political assembly and association in Uganda and the role that courts have played in their enforcement. The study found that although the concept of human rights has achieved reasonable normativity, on the ground the state of those rights remains precarious due the ideological character or content of the rights, and the political and socio-economic environment. While the courts of judicature have made bold decisions in defence of the rights, these have not gone far enough. It is contended that in the absence of a fundamental change in the political and socio-economic order, courts will not conceivably act as consistent guardians of the rights. The study was funded by Makerere University and SHUREA project, and was supervised by Frederick Jjuuko and Prof. Joe Oloka-Onyango.



### Contact

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