

Official Magazine of the African Society for Bioinformatics and Computational Biology Issue #3 July 2018

Greetings to all our readers who are enjoying a summer holiday in the north, and those who are back at University after a short semester break in the south.

The past quarter has seen a buzz around the 25th May 2018 enforcement of the new general data protection regulations in Europe that was approved by the EU

Parliament on the 14th April 2016. Universities across the board will have to review, and probably revise data management protocols in the main and specifically research data management protocols. In Africa, we have yet to come to terms with our own data protection frameworks such as Ghana's Data Protection Act, 2012 and South Africa's



Protection of Personal Information Act 2013. Lets not forget that personal data protection was addressed by the African Union (AU) in a draft Convention on "Cyber Security and Personal Data Protection". The AU Convention was adopted by member states on 27 June 2014.

It will enter into force when it has been ratified by at least 15 member states. Under the Convention each state commits itself to establishing a legal framework for data protection and to set up a data protection authority. As researchers digest the implications of both local and European data protection frameworks, we can all agree that there should be responsible collecting, processing, storing and sharing of personal information.

In this issue of The Improper Scientist, we are pleased to update you on data science initiatives and algorithms to support biobanks. The inaugural GalaxyAfrica conference has generated excitement about possibilities for expanding partnerships among American, European and African scientists in an effort to see data science for biology grow. As promised in our recent edition, we have started to feature "Women in Data Science" and we hope that you will continue to send us information about individuals whom we should feature. As part of the ASBCB mission to promote data science in Africa, we have started a section called "Hot off the press" to put the spotlight on data science or omics publications from African scientists. I encourage you to let us know when you publish your work and if you know of interesting data science articles published by African researchers.

I wish to thank the editorial team for their hard work and also the new members of our team namely ThankGod Ebenezer and Ahuno Samuel Terker.



Alan Christoffels Editor (@alangchris)



GalaxyAfrica 2018

The Galaxy Project (https://usegalaxy.org/) is well known to many biologists and bioinformaticians as a user-friendly genomics analysis work-bench. Globally the annual Galaxy conference alternates between the USA and Europe. However, April 2018 was marked as the inauguration year for the first GalaxyAfrica conference, held in Cape Town South Africa. The aim of the GalaxyAfrica conference is to establish a data intensive biology network for African biologists, bioinformaticians and technical support staff.



Figure 1: GalaxyAfrica 2018 Participants

This year's GalaxyAfrica conference (galaxyafrica.sanbi.ac.za) was held at the South African National Bioinformatics Institute on the University of the Western Cape Campus. The local organizing committee, chaired by Peter van Heusden brought together international Galaxy speakers and users. A total of 50 participants from 6 African countries contributed to an exciting conference that comprised research talks and training sessions (Figure 1).

The invited itenerant speakers at GalaxyAfrica 2018 included Berenice Batut and Björn Grüning from the University of Freiburg and Enis Afghan from the USA.



Figure 2: Dr Anwar Fahed, manager of the data intensive research iniative of South Africa

The conference including introductory material, analysis, user training, and system management skills. Presentations can be accessed from the Galaxy Africa website (galaxyafrica.sanbi.ac.za). The week ended with a Data Carpentry R workshop event.



Biobanking and Biosecurity

B3Africa AGM Uppsala Sweden

B3Africa (www.b3africa.org, Figures 4 and 5) had its 3rd AGM and work package leaders meeting in Uppsala, Sweden 11th to 13th June 2018. During this meeting, hosted by Sveriges Lantbruksuniversitet (Swedish University of Agricultural Sciences, SLU), B3Africa partners reflected on progress and achievements made over the three years of the project and discussed the sustainability of the eB3Kit.



Figure 4: B3 Africa AGM Participants

Central to the B3Africa mandate is the development of the eB3kit (www.bibbox.org) - an integrated set of biobank-related software that includes AZIZI field collection mobile App, Baobab LIMS and Galaksio. These tools are packaged as a mobile unit (Figure 6).



Figure 5: B3 Africa Work Packages



Figure 6: Biobank in a box



B3 Africa AGM



B3Africa Members at the Uppsala Health Summit

B3Africa Outputs:

Bendou, H., L. Sizani, T. Reid, C. Swanepoel, T. Ademuyiwa, R. Merino-Martinez, H. Meuller, A. Abayomi, and A. Christoffels. 2017. Baobab Laboratory Information Management System: Development of an Open-Source Laboratory Information Management System for Biobanking, Biopreserv Biobank, 15: 116-20.10.1089/bio.2017.0014.

Klingström, T., M. Mendy, D. Meunier, A. Berger, J. Reichel, A. Christoffels, H. Bendou, C. Swanepoel, L. Smit, C. Mckellar-Basset, E. Bongcam-Rudloff, J. Söderberg, R. Merino-Martinez, S. Amatya, A. Kihara, S. Kemp, R. Reihs, and H. Müller. 2016. Supporting the development of biobanks in low and medium income countries, In 2016 IST-Africa Week Conference, 1-10.

Klingstrom, T., E. Bongcam-Rudloff, and J. Reichel. 2017. Legal & ethical compliance when sharing biospecimen, Brief Funct Genomics.

Muller, H., N. Malservet, P. Quinlan, R. Reihs, M. Penicaud, A. Chami, K. Zatloukal, and G. Dagher. 2017. From the evaluation of existing solutions to an all-inclusive package for biobanks, Health Technol (Berl), 7: 89-95.10.1007/s12553-016-0175-x.

Reichel, J. 2016. Alternative Rule-Making within European Bioethics – Necessary and Therefore Legitimate?, Tilburg Law Review-Journal of International and Comparative Law, 21: 169-92.10.1163/22112596-02102005.

Reichel, J., and A. Hellner. 2016. EU Participatory Democracy from Promise to Practice: the Role of IOs and NGOs, In Law Without State, Scandinavian Studies in Law. Hart: Peter Wahlgren, Pål Wrange & Mauro Zamboni.

Women in Data Science

A little over two decades ago the significant contributions of women to the STEM field were rarely acknowledged. The focus of these contributions are often women working outside the african continent. In Africa, the field of Computational Biology and Bioinformatics is now beginning to gain popularity, attracting more life science investigators, and proving useful in biomedical and agricultural studies. We may be guided to believe that due to the exclusion of women in scientific education and genderbased bias on the continent for several centuries that we would have less women in the field of Bioinformatics. However, this has proven not to be the case. In this issue of The Improper Scientist (and over the next several issues), we shall take trips to African research institutions to uncover what African women are doing in science with a focus on Bioinformatics.



The first stop is the University of Mauritius, in Mauritius, Eastern Africa, where we meet Dr. Shakuntala Baicho who is the Team Lead for the Pole Research Excellence (PRE) – Computational Biology and Bioinformatics. We asked her five questions about the University of Mauritius, her research interests, current job, and career path. We also went further to ask her about the gender bias in her institution and other female Bioinformaticians in her institution.

Dr Shakuntula Baicho

1. Could you please tell us about the University of Mauritius?

Established in 1965 by an Act of Parliament to assist in the development of the country, the University of Mauritius (UoM), is the premier University of the Republic of Mauritius. The former College of Agriculture which was set up in 1914 became the foundation stone on which the bases of the UoM were laid. Initially consisting of the Schools of Agriculture, Administration and Industrial Technology, the UoM has grown significantly over the past five decades and presently comprises of the Faculties of Agriculture, Engineering, Law & Management, Science, Social Studies & Humanities, and Information, Communication and Digital Technologies. The University also comprises 6 Centres: Centre for Innovative and Lifelong Learning, Centre for Biomedical and Biomaterials Research, Centre for Professional Legal Studies, Centre for International Sustainable Tourism and Hospitality, Centre for Research on Slavery and Indenture and the Centre for Information Technology and Services. Other units are the Doctoral School, a Knowledge Transfer Office and a Confucius Institute.

The UoM is the largest University of the country both in terms of student population and programmes offered, having a student enrolment figure of around 10,500, offering 226 programmes of studies (181 undergraduate programmes and 45 postgraduate programmes) as well as MPhil/PhD programmes. It has a full-time staff of 984 (301 academics and 683 administrative, technical and support staff). The UoM also employs a significant number of industry professionals on a part time basis to support full time academics. The homepage of the University of Mauritius is: http://www.uom.ac.mu/

2. What are your research interests?

My research is focused on Efficient Data Structures and Algorithms for genomic data analysis, Distributed Computing applied to bioinformatics (including pipelines and workflows) and Machine Learning applied to bioinformatics and health informatics.

3. Describe your current job?

I am presently the Team Lead for the Pole of Research Excellence (PRE) Computational Biology and Bioinformatics and an academic at the University of Mauritius, where I have to do teaching, research and administration. As part of my teaching I give lectures in programming, algorithms, computational biology/bioinformatics & distributed systems. I also supervise final-year projects and part of this research I supervise is MPhil/PhD student work done on research projects. Most of my research projects are related of bioinformatics and health informatics. As part of the administration i do, I have to participate in committees at faculty and University level; I also need to do programme coordination.

4. What was your career path?

I have done all my training in Computer Science, more precisely I have an undergraduate degree in Computer Engineering (1993), an M.Sc. In Distributed Interactive Systems (1998) and a PhD in Computer Science (2006) (Topic: Distributed Object Computing for Multimedia Applications). After completing my PhD I gradually moved to the field of Computational Biology and Bioinformatics and I find it so fascinating that I am still learning new things in this field. I also realise that my training in Distributed Systems is very helpful in Bioinformatics Data Analysis. Prior to joining the University of Mauritius in 1996, I have worked for two years as a trainer at SITRAC (State Informatics Training Centre) which has now become the University of Technology, Mauritius. In 1996 I joined the University of Mauritius as a lecturer, then got promoted to Senior Lecturer in 2002, and Associate Professor in 2018. Note that it took me some time from Senior Lecturer to Associate Professor as I was doing my PhD on a part-time basis until 2006, then was reorienting my area of research to Computational Biology and Bioinformatics. Also, I have two boys now aged 19 and 16, so was giving more time to them while they were growing up, until 2012.

5. How big is the gender bias in your institution/country and what opportunities are there to promote women?

I do not feel that we have any gender bias as such in the University of Mauritius. For example, we have had a woman as the previous Vice Chancellor of the University and another woman as the previous President of Mauritius. Also, there are a number of women Professors in the University of Mauritius and women at managerial posts in various companies in the country.

6. Can you get names of a few women Computational scientists/Bioinformaticians at your institution?

Ms Zahra Mungloo-Dilmohamud and Dr. Anisah Ghoorah from the same department and Faculty as myself (Computational Biology and Bioinformatics). Prof. Yasmina Jaufeerally-Fakim from the Faculty of Agriculture. (Molecular Biology and Bioinformatics) Finally, we have a number of women Computer scientists in our Faculty (FoICDT) at the University of Mauritius.

It's particularly fascinating to get to see the success in the propagation of Computational Biology and Bioinformatics at the University of Mauritius. More interestingly is to see how women are at the forefront of this advancement. In our next issue, we will move North of the African continent at the Institute Pasteur de Tunis where we shall look at the women bioinformatics community.

Hot Off The Press!!

African based scientists develop a model framework to guide genomics research and biobanking in Africa

The number of genomics research and biobanking projects in African countries are rising, due to increased research funding, bioinformatics/data science capacity building programmes across the region and the recent scientific agenda to explore African's genome diversity to be able to answer some of the pressing health challenges with both regional and global impacts. Although, the benefits of these research activities are far reaching, some caveats may be astounding, particularly relating to ethics, laws and societies in the context of genomics research in many African countries. Many African institutions may have guidelines supporting human research, sample collection, processing and publications. Yet recent anecdotes of irresponsible research conduct, the so-called helicopter or parachute science, particularly by erudite researchers with

well-equipped labs in developed countries, has prompted the need for more rigorous, sustainable and perhaps harmonious ethical frameworks to support genomics research in Africa. Despite the calls by African scientists to have more control of their genomic data, innovative ways for informed consent process and documentation, ensuring confidentiality and privacy, handling of incidental findings, cost and benefit sharing, among others are also warranted. In light of the above-mentioned, a new model framework for governance of genomic research and biobanking in Africa has been developed by UCT-based bioethicist, Prof Jantina de Vries, and colleagues across the African continent to support either North-South or South-South research collaborations and to ensure that the benefits of such research activities are realized by the people in Africa. The development of the framework took into account the cultural perspective of Africa populations in addition to other key elements or principles to revere African cultures and values in communities where research is being conducted. Although this voluntary framework is not selfimposing at the moment, its recommendations may be useful to many African institutions grabbling with how to handle genomic research in a data driven era.

Read the full report here: https://aasopenresearch.org/articles/1-13/v1

Community of Special Interest Groups

We launched the community of special interest groups at the ASBCB conference in Entebbe in October 2017. It is hard work for individuals to rally support and sustain the momentum felt at the Entebbe conference. I would urge all those who are looking for a smaller community of discipline-specific scientists to get involved in the COSIs. Here is a reminder of the groups that were initiated and the contact details.

Structural Biology and Drug design (structuralbio@asbcb.org) Metagenomics group (metagenomics@asbcb.org) Pathogens group (pathogen@asbcb.org) Population genomics (popgen@asbcb.org) System administration (sysadmin@asbcb.org)

Contributors

Alan Christoffels, SANBI-University of the Western Cape Campbell Rae, SANBI-University of the Western Cape Amel Ghouila, Institut Pasteur de Tunis ThankGod Ebenezer, Earlham Institute (formerly The Genome Analysis Centre (TGAC)) Norwich Research Park Innovation Centre Ahuno Samuel Terkper, Kwame Nkrumah University of Science and Technology (KNUST)

We welcome volunteers who wish to contribute to the following areas of the magazine:

*Editorial Team

*Individuals to aid in translating the newsletter to French and Portugese

- *Layout and Design we are looking for individual who wish to exercise
 - their creativity in improving the look at feel of the magazine
- *Articles contributions related to any of the themes outlined in the magazine.

Please submit all contributions to contact@asbcb.org

ASBCB Governing Council

Vice President:

Segun Fatumo **Research Fellow** in Global Health and **Population Sciences**, Department of Medicine, University of Cambridge

Treasurer:

Marion Adebiyi Dept of Computer and **Information Sciences** and CUBRe, **Covenant University**. Ota. Nigeria

Alan Christoffels Sounth African National **Bioinformatics Institute**,



President:



Alia Benkahla Lab of Bioinformatics, **BioMathematics and BioStatistics Institute Pasteur of Tunis**

Secretary:



Amel Ghouila Laboratory of Transmission, Control and Immunobiology, of Infections (LTCII), Institut Pasteur de Tunis



Natasha Wood Computational Biology Group, **Department of Integrative Biomedical Sciences**, University of Cape Town

Vision

Governing Council members:

To facilitate the development of African scientists as leaders in bioinformatics and computational biology

Mission

To be a scholarly society dedicated to advancing, developing and promoting bioinformatics and computational biology in Africa.

Serve a global membership through distribution of valuable information about training, education, employment and relevant news from related fields.

> Encourage the application of bioinformatics in Africa to improve the livelihood of people.