

# **Bioinformatics Degree Development Workshop**

**Gaborone 11<sup>th</sup>-12<sup>th</sup> March 2014**



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Pan African Bioinformatics Network for H3Africa

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# Some topics to be covered

- Which degree programmes are available in Africa
- Who would like to start one?
- What are the challenges faced at African institutions and how to overcome them
- What bioinformatics curriculum should be taught and in what format
- How to train the trainers
- How to facilitate cross-institution training and supervision



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# Potential outcomes

- Discussion on merits of different degree programs
- Proposal for a curriculum
- Potential for cross-institution degrees
- Ideas on overcoming challenges
- Proposal for shared resources
- Documentation on how to proceed



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# Bioinformatics Postgraduate Degrees in South Africa

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# Outline

- **Some history**
- **Current degrees**
- **Joint training program**
- **UCT in more detail**



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# History from the NBN (1)

- National Bioinformatics Network (NBN) formed in ~2003
- Funding for nodes to do
  - Research
  - Services
  - Training
- Funded a number of postgraduate students (MSc and PhD)
- Decided students should receive additional training



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# History from the NBN (2)

- NBN started “national” NBN courses
- Established education committee
- Developed a curriculum
- Courses 2 semesters of ~8 weeks
- Compulsory for NBN funded students



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# NBN course curriculum

- Python
- Algorithms
- Genomics I
- Hardware & networking
- Linux
- Statistics I
- Database theory
- Genomics II
- High-throughput biology
- Pharmacogenomics
- Proteomics
- Structural bioinformatics
- Systems biology
- Writing and ethics
- Probability modelling
- Statistics II
- Microarrays
- Databases
- Phylogeny
- Ontologies



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# Issues & challenges

- Students from very different backgrounds and levels
- Courses were too long:
  - Expensive
  - Too much time away from projects
- Finding lecturers –started international and moved to local trainers
- Need to make sure of quality
- Need to adequately assess students and evaluate courses



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# Current degrees

- Honours in Bioinformatics
  - University of Pretoria, University of Cape Town...
- Masters in Bioinformatics by dissertation
  - UCT, UWC, Univ Pretoria, Wits...
- Masters by coursework and dissertation
  - Rhodes University
- PhDs
  - Most of the universities who have Bix units



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# Joint training program

- Continued after NBN by ex-NBN EdCom
- Courses cut down to one set 6-8 weeks
- Curriculum:
  - Week 1 –programming/biology
  - Python programming -throughout
  - Biological databases, genomics, microarrays, proteomics, statistics, phylogenetics, NGS, systems biology, population genetics



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# Disadvantages

- 7-8 weeks away from projects
- Cost to house non-local students for 7 weeks
- Finding lecturers available at right time



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# Advantages

- Not enough critical mass therefore share resources
- Lecturers only have to give module once
- Sharing of lecturers –teach all students from different institutions



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# Advantages to students

- Exposure to variety of topics
- Exposure to academics from other institutions
- Networking with students
- Learn from other students



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# UCT in more detail

- Started undergraduate stream in bioinformatics
- Changed to dual major with specialisation
- Introduced Honours program
- Masters and PhD –dissertation only
- Examiners must be external and international
- Intake for MSc and PhD seldom from undergrad or Honours



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