Bioinformatics Degree Development Workshop

Gaborone 11\textsuperscript{th}-12\textsuperscript{th} March 2014
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
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
Bioinformatics Postgraduate Degrees in South Africa

Nicky Mulder
Outline

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

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

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

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