Careers in Computing and Science

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The Obligatory Introduction Slide

• Overview of Computing in Science – with a focus on biology
• Look at the work environment for computer professionals in the sciences
• High level overview of the different degrees and what their holders do
• End with example employment by specialty
Computers in Science

A few examples
Work Environment

What do you do, day-to-day
Two Work Environments

• **IT shop associated with a science project**
  - Work with other IT professionals
  - Focused work within a team
  - Defined career path

• **Embedded IT Person**
  - Usually works directly with scientists
  - Very independent
  - Broad skill base
  - Poorly defined professional progression
Research Technologies at Indiana University-Bloomington

- Office work environment
- Chains of command
- Defined tasks and expectations
Precision Proteomics at Northwestern University
And Laboratories Everywhere

- More relaxed
- Collaborative/team projects
- Goals are “fluid”
- Skills are more open: learn how to do it, then do it…
Degrees and Certificates

What degrees are out there, and how do I get them?
Being a Scientist requires education

• BS required for academic professional
• MS required for many technician-level jobs, as well as administrative and Community College positions
• PhD to manage science projects
• Post docs (and beyond) to run your own lab

You can work in the sciences without being a scientist.
Know your degrees

- Bachelors aka Baccalaureate is a common milestone
- Frequently an AA plus two years at a four-year school can get you a Bachelors.
- Graduate degree programs care very little about the path you take to your bachelors (In my experience).
- Only in special cases does an AAS give you transferable credit hours for a BS.
Why get a Bachelors in IT

Intangibles

- Job security
- Opportunities
  - Relocation
  - Promotion
- Salary and benefits
Associate of Arts is a “way point”

• “Once you get a degree it is yours to keep”
• Generally transferable across the country

• Good value:
  http://www.clarkstate.edu/net_price_calculator
  http://www.ohio.edu/admissions/fees.cfm

• Save $22,308 by going two years at Clark before going to Ohio University

• (Of course, you know you would rather go to IU 😊)
Transfer Credits

As an aside, I used to be a university registrar...

• AAS does not carry the same weight when transferring as an AA degree.
• Clark State has some great articulation agreements with other Ohio universities.
• 7 year clock on credits.
• AA + AAS = Good
Value of Graduate Technical Degrees

Another aside

- Beyond BS, more education does not equal more money.
- Greater flexibility and employment options.
- Better employment stability.
Who’s Who

Jobs in science by education required
Technical Support

- In the sciences this is often provided ad hoc.
- Institutions or departments may have “level 1” help desk support.
- Very heterogeneous computational environments
Networking

• Certification plus AAS
• You don’t need to worry about what runs over the wires...
• In the sciences, between the laboratories and the world, networking is handled by the institution; within the lab, by an “embedded” IT person.
Systems Administration

- They are the glue that holds academic science together.
- Usually requires a bachelors degree (in an academic lab).
- Broadly skilled and social
Database Administrators

• Lots of databases in the sciences – but not that many DBAs.
• Again usually Bachelor’s degree plus certification.
• Frequently paired with programming.
• Well-paid by academic standards, low by industry standards.
Computer Programming
Programmers and Analysts

• Working on scientific computer programs almost always requires a Bachelor's degree.
• A lot of scientific applications are written by non-professional programmers who hold advanced degrees in the applications domain.
• Salary is frequently not competitive with industry, but the perks can be good.
Not all programming is equal
Software Engineers

• Typically hold Bachelor of Science or Master of Science degrees specialized in “best practice” programming.

• Highly respected...

• Even the best software engineers need domain knowledge.
Bioinformaticians

Experimental Biology

Information Technology

Statistics

Bioinformatics

Computer Science
Bioinformatics

• Typically done by PhDs or Master’s level analysts.

• Starting to see more Bachelor-level analysts (CS-Biology double major is a winning combination)

• A lot of IT support is required for the bioinformatics people.

(This only made the list because it is my field)
Use LinkedIn for professional growth

• It’s free

• Join relevant groups

• But don’t embarrass yourself
What I want you to remember

1. Finish your degrees.
   (two half degrees do not equal one whole degree)

2. Once you finish your associates – start thinking about your Bachelors degree.
   (Beyond that maybe, maybe not)

3. There is a lot of flexibility in careers and education – particularly in the sciences.
Thank You

Questions?

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Questions

%%% phd.m
%%% author: Cecilia
%%% date: 09/08/05

load THESIS_TOPIC

while (funding==true)
    data = run_experiment(THESIS_TOPIC);
    GOODENOUGH = query(advisor);
    if (data > GOODENOUGH)
        graduate();
        break
    else
        THESIS_TOPIC = new();
        years_in_gradschool += 1;
    end
end
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