UNIVERSITY OF CAMBRIDGE

Computer Science @ Cambridge

Our Key Aims

To give an understanding of fundamental principles that will outlast today's technology

To produce graduates who **create** the future not just cope with it

A Department of Firsts

75 Years!

1937 – First CS department in the world

1949 – First stored-program computer (EDSAC)

1953 – First CS qualification (diploma)

1958 – EDSAC2

1989 – Full CS degree introduced

1964 – TITAN

1968 – Created BCPL (precursor to C)

2003 – Spun out Xen

2012 – Raspberry Pi

The Course

UNIVERSITY OF CAMBRIDGE

Year 1	Year 2	Year 3	Year 4

B.A. | **M.Eng.**

Part IA	**Part IB**	**Part II**	**Part III**
Fundamentals	Theory	Free choice of advanced topics	Free choice of research topics
Programmming	Systems		
Electronics	Hardware		
Maths	Programming		
[+Option]	Group Project	Personal project	Research project

First Year: CS with NST/PPST

UNIVERSITY OF CAMBRIDGE

Computer Science

Maths from Natural Sciences

Option from NST or PPS
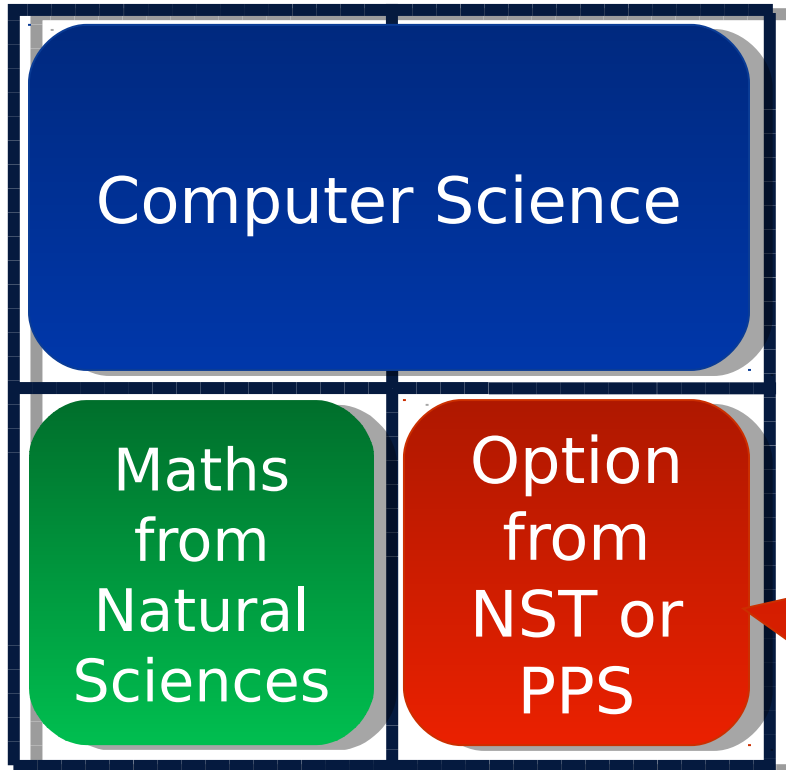
Any <u>one</u> of:
Physics
Social Psychology
Evolution & Behaviour
Geology
Chemistry
Physiology of Organisms

It is possible to switch out of CST to any of these subjects in the second year

First Year: CS with Maths

Computer Science

Maths from Maths Tripos

Half the Maths that a full maths undergraduate would do

BUT you can't then do maths in your second year

First Year: NST CS Option

UNIVERSITY OF CAMBRIDGE

Maths from Natural Sciences	Computer Science
Option from NST	Option from NST
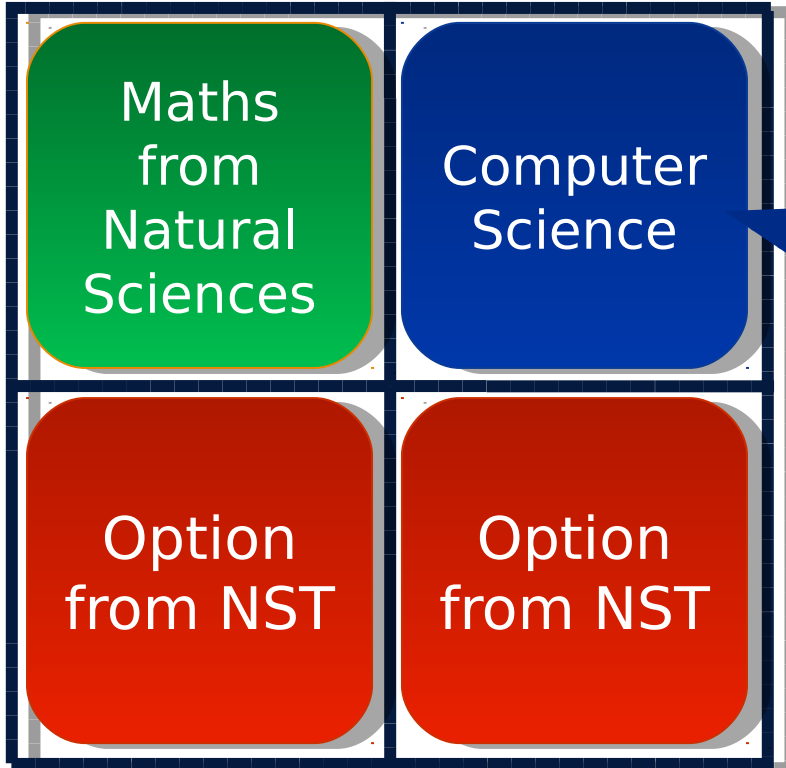
Half the CS a CS undergraduate would do

It <u>is</u> possible to catch up the other half and switch to CST in the second year, but this is not the recommended route

Course components

12 one-hour lectures per week

Plus similar time in review and private study

6+ hours of practical work

More detail shortly...

3-4 one-hour supervisions per week

Each requires around 4 hours of preparation

Practical skills

Year 1

Weekly practicals covering electronics, O/S, Java, ML

Year 2

Weekly practicals in advanced Java, Prolog, hardware.
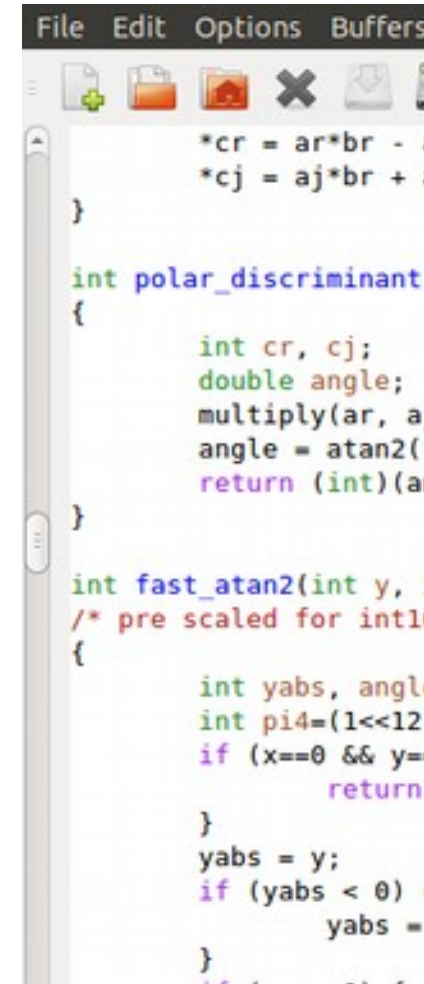**Group Project** (team work)

Year 3

Personal project

Year 4

Research project
Some modules associated with additional practicals

Programming Languages

- The language doesn't matter!
- We teach fundamental programming **principles**

- Currently Cambridge uses:
  - Java, C/C++ for imperative programming
  - ML for functional programming
  - Prolog for logic programming
  - Verilog for hardware programming

File   Edit   Options   Buffers

```
    *cr = ar*br -
    *cj = aj*br +
}

int polar_discriminant
{
    int cr, cj;
    double angle;
    multiply(ar, a
    angle = atan2(
    return (int)(a
}

int fast_atan2(int y,
/* pre scaled for int1
{
    int yabs, angl
    int pi4=(1<<12
    if (x==0 && y=
        return
    }
    yabs = y;
    if (yabs < 0)
        yabs =
    }
```
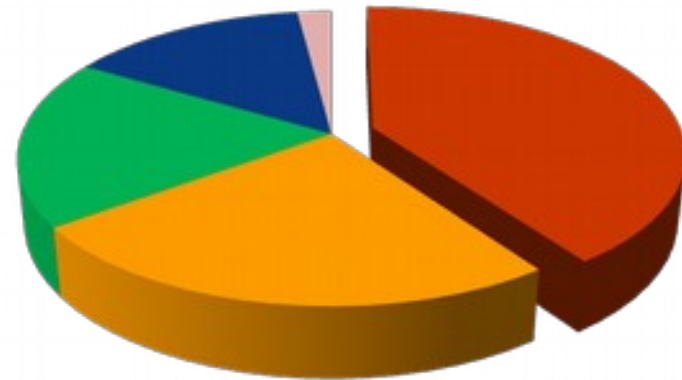
Programming Experience
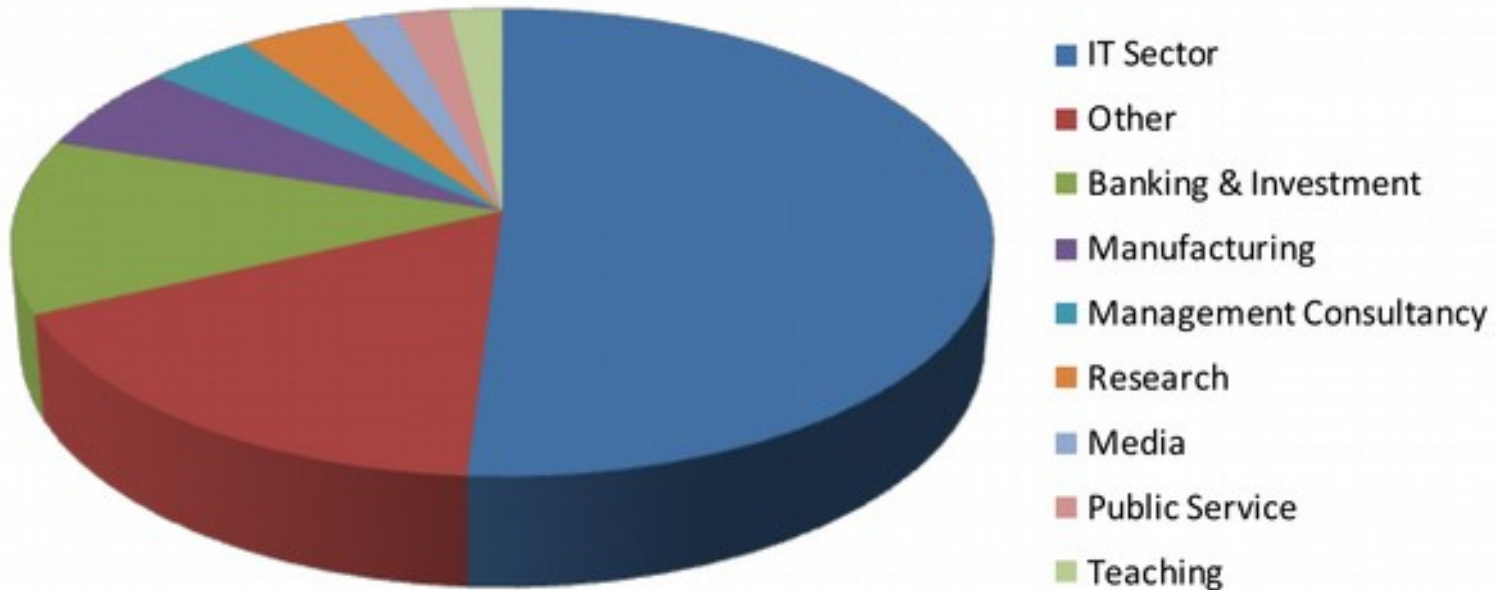

You DON'T need programming experience

- We teach from the ground up. Programming experience is likely to provide a small advantage in the first year

- Any advantage has gone by the second year

A survey of first years...

- No experience (39%)
- Not much experience (24%)
- Some experience (18%)
- Quite a lot of experience (14%)
- Programming expert (2%)

Employability

The course gives vital skills for every sector. Good computer scientists go on to a multitude of careers: IT, business, politics, finance, science, engineering, education, arts

- IT Sector
- Other
- Banking & Investment
- Manufacturing
- Management Consultancy
- Research
- Media
- Public Service
- Teaching

Very sought-after graduates

What job shortage?

• Our annual recruitment fair attracts 50+ companies, each looking to recruit 3 or 4 graduates on average

• We only produce ~90 graduates in total!

Some of the 2013 Companies

Google, ARM, Amazon, Disney, Barclays, Cisco, BT, Mozilla, MathWorks, Citrix, Frontier, Red Gate, Morgan Stanley

Prerequisites

A*AA at A-Level

A-Level Maths

- is absolutely essential

Further Maths

- to AS is essential (<u>if</u> your school offers it)
- to A2 is desirable
- AEA or STEP useful (required for CS with Maths)

Other A-Levels

Physical sciences

- Very useful and desirable
- Prerequisites for some IA options

Electronics

- Relevant and useful
- But not as desirable as maths and physical sciences

The Working Environment

More info…

Our Website:
www.cl.cam.ac.uk/admissions/undergraduate/

This Presentation (PDF)

Email: undergraduate.admissions@cl.cam.ac.uk