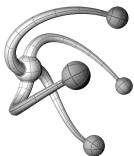


# Origins of Computer Science

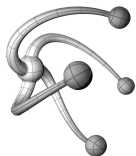
COMS12303

Simon Hollis  
David May

First Semester 2008/9



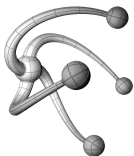
# What are the true origins of Computer Science?



# Could they be coffee?!

Well, certainly, the answer is 'Yes!' if talking about the world's first 'web-cam'!

*“Several people have asked about the origins of the Trojan Room coffee pot. It started back in the dark days of 1991, when the World Wide Web was little more than a glint in CERN's eye.”*



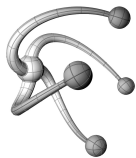
*“A need or problem encourages creative efforts to meet the need or solve the problem.”*

*(“Necessity is the mother of invention.”)*

*— Plato, Republic*

*“...being highly dedicated and hard-working academics, we got through a lot of coffee, and when a fresh pot was brewed, it often didn't last long.*

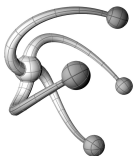
*Some members of the 'coffee club' lived in other parts of the building and had to navigate several flights of stairs to get to the coffee pot; a trip which often proved fruitless if the all-night hackers of the Trojan Room had got there first. This disruption to the progress of Computer Science research obviously caused us some distress, and so XCoffee was born.”*



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# Innovation

*“In the Trojan Room there were several racks of simple computers used in the testing of our networks. One of these had a video frame-grabber attached and was not being used at the time. We fixed a camera to a retort stand, pointed it at the coffee machine in the corridor, and ran the wires under the floor to the frame-grabber in the Trojan Room.”*

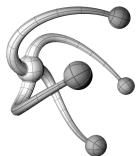
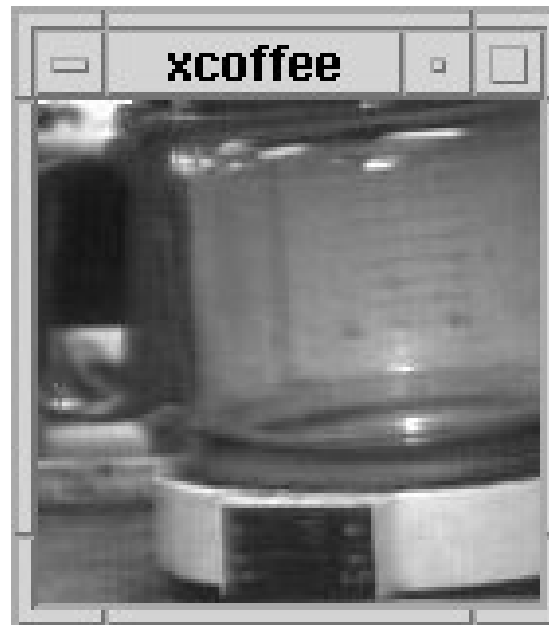


# A good engineering approach

*“The image was only updated about three times a minute, but that was fine because the pot filled rather slowly, and it was only greyscale, which was also fine, because so was the coffee.”*

For more information:

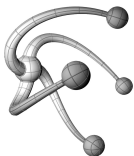
<http://www.cl.cam.ac.uk/coffee/qsf/coffee.html>



# Conclusions

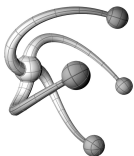
Innovation in Computer Science has always been driven by new needs. e.g.,

- Mathematical problems required large numbers to be computed;
- Large numbers are difficult for humans, so a machine was needed;
- Machines and humans think and talk differently, so Interfaces and Operating Systems were needed;
- Operating systems require Memory Management, so that exists; and so on.



# Overview of the Origins course

We will aim to such questions as, “What is the origin of...” by giving a historical perspective of the various sub-topics in Computer Science.

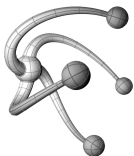


# Course streams

There will be four main subject streams in the Origins course:

- 1) Early machines;
- 2) History of programming languages;
- 3) Speech and robotics development.
- 4) Social impacts of computing;

Each will include roughly three lectures, a discussion session and a piece of coursework.

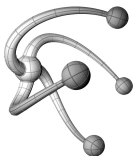


# Assessed coursework

This unit's mark is based on 100% coursework, broken up as follows:

- 4 x one-page topic précises (this term)
- 1 x presentation (next term)

Each is worth 20% of the final mark



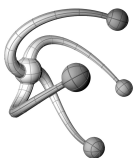
# Précises

You will all be expected to produce four, one-page long essays, one on each of the topic streams.

The **maximum** length, excluding references will be one side of A4.

We will enforce this strictly, by marking down essays that exceed a side.

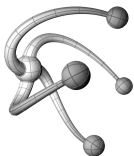
Therefore, the ability to digest, précis and argue succinctly will be vital in this course.



# Précis Marking

We will be looking for:

- An argument based *your* take on one of the subjects you have seen in a course theme;
- The quality of your argument;
- Citations to back up your argument;
- Proper scientific writing, with correct structure and grammar;
- An interesting read!



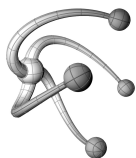
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# Presentations

Next term, each student will need to give a ~10 minute presentation on a chosen sub-topic they have found interesting during their research.

This will be assessed on content, argument, rigour and presentation ability.

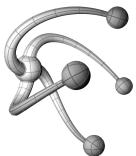
More details closer to the time.



# Discussion sessions

To aid both the clarification and development of both the ideas presented the lectures and those gathered through independent research, there are four discussion sessions allocated in this course.

During these sessions, the aim is for **you** to bring forward new ideas and increase the understanding and breadth of a topic for both you and the group. To do this, we want you to talk!

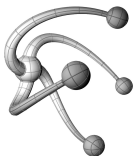


# Timetable

Here is the current timetable for Origins of Computer Science. This **may change**, and the definitive version is always the one on the website:

<http://www.cs.bris.ac.uk/Teaching/Resources/COMS12303/>

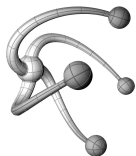
Submission Guidelines and Deadlines are also available there.



# Room changes

There are already some room changes, compared to your faculty-produced timetable:

- The discussion groups on the 25<sup>th</sup> of November and 9<sup>th</sup> of December will move to Room 1.06 in the Merchant Venturers Building;
- All presentation sessions will also be in 1.06 MVB.

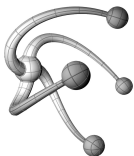


# Research Methods

We hope that by the end of this unit you will be able to rigorously analyse the quality and content of a variety of external information sources, for example:

- Journal papers;
- Library matter;
- Internet material.

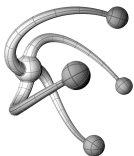
This skill is vital for success in both your degree and future careers.



# Today's reading list

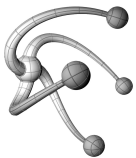
Walterio Mayol-Cuevas would like you to read a paper before his lecture on November the 27<sup>th</sup>. It is available at the bottom of the unit webpage:

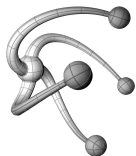
W. Grey Walter, **A Machine that learns**,  
*Scientific American, August 1951.*



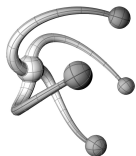
# Questions

Any questions on the course format?





Slides after here now in “Research Techniques”  
lecture.

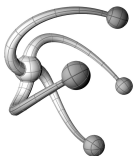


# Researching a topic

Research is **highly** divergent, so plan carefully the information you wish to find.

Think: what do I need, and where am I most likely to find it?

- For pre-1945 information, try books first;
- For 1945—1990, try journals first;
- For information in the last decade or so, try an online search first.



# Researching a topic

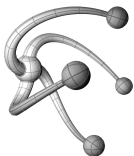
Many (but not all) Computer Science-related journals are online. The university has a subscription to most, and access will automatically be granted when using a university computer.

Examples of highly-regarded sites include:

IEEEExplore: <http://ieeexplore.ieee.org> (for IEEE Transactions and refereed conferences)

IEEE Computer Society and ACM Transactions on Computing: <http://www.computer.org>

Citeseer: <http://citeseer.ist.psu.edu>

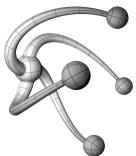


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# Researching a topic

**DO NOT** just accept the first information you find at face value!

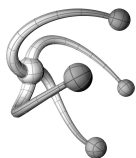
- Check it for bias and obvious inaccuracies first.
- Reference books are generally reliable, but journal papers are (almost always) biased to the author's topic and subject leaning.
- Be especially careful on the internet, where information may not be refereed, or even checked by anyone else.



# But Wikipedia knows everything...

From the Wikipedia entry for Wikis:

“Most people, when they first learn about the wiki concept, assume that a website that can be edited by anybody would soon be rendered useless by destructive input. It sounds like offering free spray cans next to a grey concrete wall. The only likely outcome would be ugly graffiti and simple tagging, and many artistic efforts would not be long lived. Still, it seems to work very well.[7]”



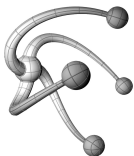
# Those magic numbers: e.g., “[7]”

Always check the small print!

*[7] Richard Heigl, Markus Glaser, Anja Ebersbach(2006), p.10.*

This, very subjective comment, was probably originally written in German

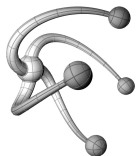
- What could have been lost in translation?
- Is the author qualified to give such an opinion?
- Is he the only person with this opinion (dubious), or is it more mainstream (likely to be more reliable, but still no guarantee)?



# Researching a topic (cont.)

The need for the critique of subject material is important, whatever the source.

Compare and contrast different viewpoints, to try and find the truth, which usually lies somewhere in the middle ground (for example, compare the opinions on Cameron from The Telegraph and The Guardian)



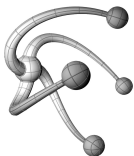
# Researching a topic (cont.)

Also be aware that you, as the reader, may impress bias, especially if you are inclined (rightly or wrongly) to disagree with the author.

With careful practice, you should be able to reduce this down to a manageable extent, but it may still affect your selection of material in the first place.

*"Understanding is a three edged sword: your side, their side, and the truth"*

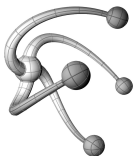
*– J. Michael Straczynski*



# Researching for your précis

You have only one side to write on, so the temptation to read only the core material and regurgitate will be high.

Avoid this, since the more material you read, the clearer the big picture may become; and ultimately this will help you produce a coherent piece of text.



# Researching for your précis

There are recommended papers on the unit website.

Try to read as many as possible --- they should be comprehensible to all, **AND** find some additional material of your own.

This will allow you to make optimum use of the discussion sessions.

