

Undergraduate computer science talks series
at Churchill and associated colleges

Matthew Ireland, Márton Erdős & Luana Bulat

Wednesday 9th October (Gregorian & Revised Julian)

Wednesday 17th October (Symmetry454)

BoomTime, Day 63 of The Aftermath, YOLD 3185
(Discordian)

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... why? ...

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- ▶ An integral part of your college education
- ▶ For your DoS reference
 - ▶ Dependable, good communicator, passionate about computer science.

Increasingly, employers are looking for clear evidence of ability and achievement in **oral**, written, **visual** and electronic communication.

Prizes

- ▶ Glass trophies: best **theory** talk, best **applied** talk, and **audience favourite**



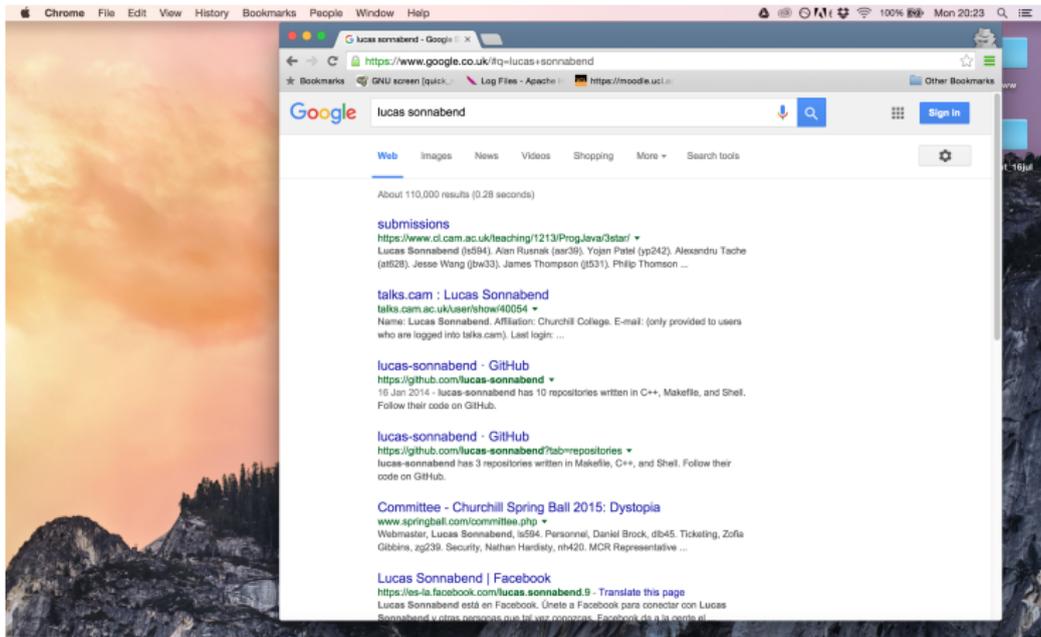
Prizes

- ▶ Certificates of distinguished achievement for good attempts at explaining conceptually challenging material.

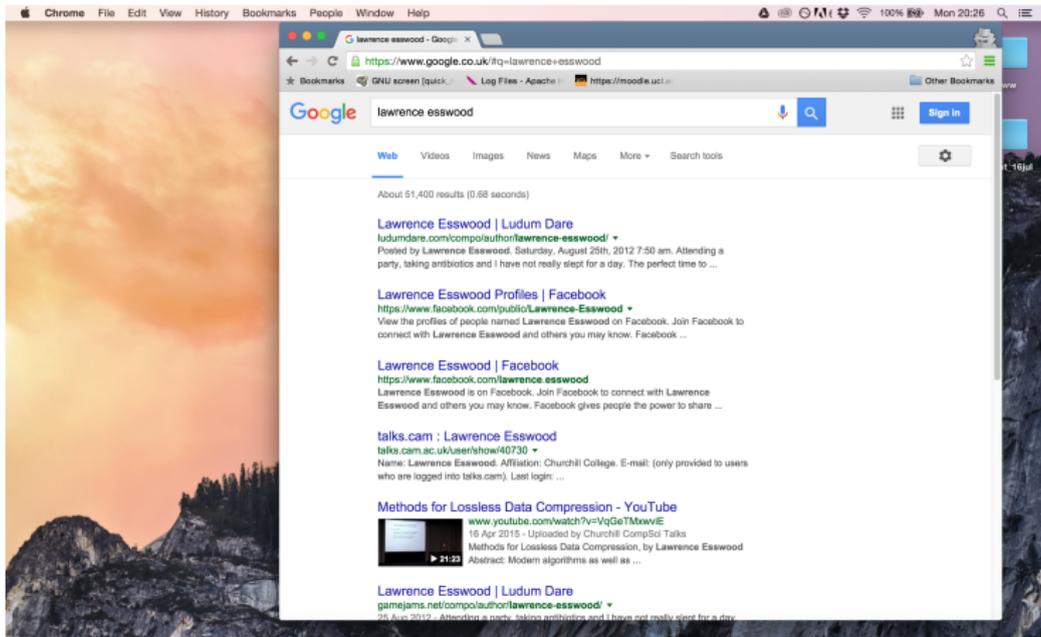


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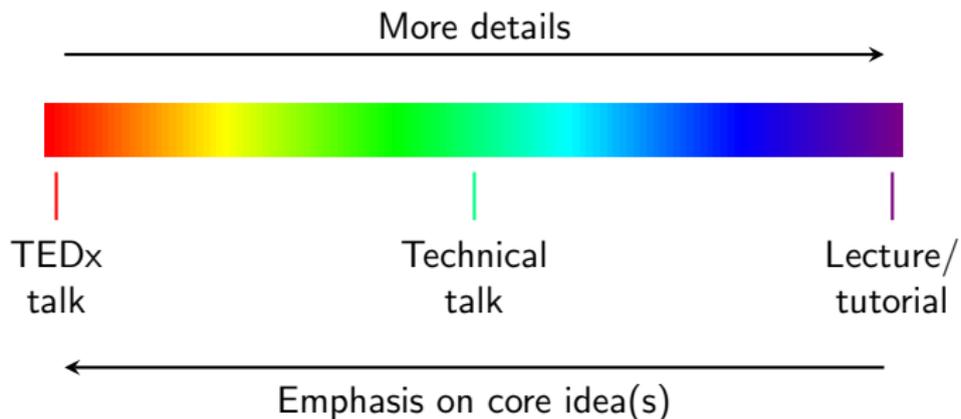
A good advert when done well.

Format of the talks series

- ▶ Everyone in IB/II gives one talk per year.
- ▶ Two or three talks every Wednesday evening. Prompt **1900** *sine tempore* start.
- ▶ Location: Wolfson Hall (most of the time)
- ▶ Presentations: max. 27 minutes each (aim for 25)
- ▶ Q&A: up to 15 minutes
- ▶ No food in the Wolfson Hall!
- ▶ No mobile phones or laptops (unless you talk to us in advance)



What are the talks like?



We reward well-developed, clear explanations of fine technical detail.

Image: Jasper Lee

Timing

- ▶ The part that needs most preparation (and is hardest to get right)
- ▶ Aim for 25 minutes
- ▶ Absolute max. 27 minutes
- ▶ Lose marks if outside range 24–27 minutes
- ▶ Scripting small sections may help with timing allocations
- ▶ Up to you whether or not you'll allow questions during the talk (no adjustment in timing allocation)
- ▶ Adaptation is an important skill to learn, but adjusting/inventing a plan “on the fly” will decrease the quality of your talk
- ▶ Send us the slides before your talk.

Recordings

- ▶ We video record the talks
- ▶ The primary reason is for consistent judging
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- ▶ **It's best to use the college laptop.**

Feedback

Two forms:

- ▶ **From us, after the talk**
 - ▶ Grab a drink (this doesn't have to mean Port, but it can do;)
 - ▶ We give feedback
- ▶ **From the community, via an online form**
 - ▶ Fill in after the talk

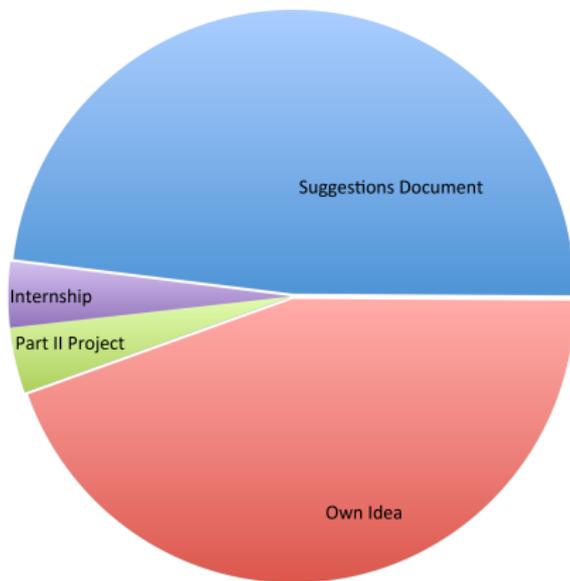
Themes from last year's survey

- ▶ You want us to talk to you about the content after you've done the research, before you start writing the slides.
- ▶ Audience like practical **demos** and working through concrete **examples**
- ▶ Don't put too much content into your talk
- ▶ People learn more from presenting than being in the audience
- ▶ People don't like talks they don't learn from
- ▶ People wish they'd started preparing earlier
- ▶ People find the process valuable and enjoyable

How to choose a topic

- ▶ We have a list of suggested topics.
- ▶ It's usual to pick one of these, or use them for inspiration.
- ▶ You can pick your own, but involve us early!
- ▶ Internship: OK, but need to add insight into an area of computer science. Can't just describe what you did.

How to choose a topic (2)



Sources of topic in 2014–15.

Suggested topics

- ▶ Look at the kinds of topic we're suggesting
 - ▶ The technical focus of each suggestion is narrow, but they require you to formulate insights using knowledge from across CS
 - ▶ Getting the scope of a talk right is difficult... the suggestions are there to help
- ▶ Some of the theoretical topics are a lot more practical than you think
- ▶ We include resources to help get you started.

Suggested topics (2)

- ▶ Examples:
 - ▶ *The Nature of Entropy*
 - ▶ A fundamental concept with much confusion surrounding it.
 - ▶ Thermodynamic entropy, statistical entropy, information entropy, ...
 - ▶ *Proofs: A complexity theoretic perspective*
 - ▶ Many ways to look at a proof other than the obvious.
 - ▶ Complexity theory community has been very successful in isolating what a proof is.
 - ▶ *Indistinguishability*
 - ▶ Lots of security definitions use this.
 - ▶ Applications in UI design.
 - ▶ *Computation with cellular automata*
 - ▶ Looking at cellular automata from a computation theory perspective
 - ▶ What sort of programs can you run?

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 - ▶ Some PtIAs might be there.
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 - ▶ But lengthy to setup and make sure they work!

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 - ▶ But lengthy to setup and make sure they work!
- ▶ Practice, practice, practice!

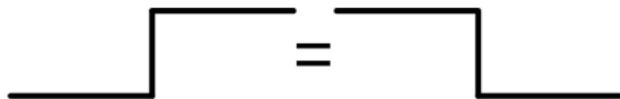
More advice

- ▶ Tell the audience why your subject is interesting
- ▶ Make the talk relevant
- ▶ <https://www.youtube.com/watch?v=GfFtgypAjxM>

Transition signalling – events

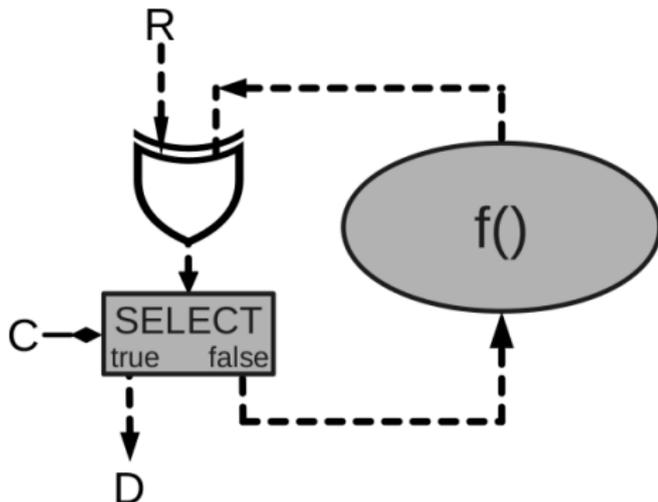
Definition: Event

Any change (edge) in a control signal



- Absolute levels do not matter on control wires
 - but we may compare two control signals (compares the parity of the number of events)
- We will have separate control and data wires

Combinations – while loop



while (!C) f();

How to ask good questions

- ▶ Participation matters!
- ▶ Following and understanding a technical talk isn't easy. We're trying to train you to do so.
- ▶ A good question might:
 - ▶ Bring new connections into discussion
 - ▶ Start a lively discussion
- ▶ Don't be afraid. The more you do it, the easier it will become. The first time is the hardest!
- ▶ Asking good questions that lead to lively discussions is fun!

How to write an abstract

Should:

- ▶ describe what your talk is about.
- ▶ help people to decide if it's relevant to them (include keywords to generate excitement).
- ▶ make them want to attend if it is.
- ▶ place your talk in a broader context.
- ▶ give an outline structure of the talk (written in an interesting way).
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Needs to be submitted by 4pm on Saturday before your talk.

How to write an abstract (2)

Data centers play an important role in modern companies. With this rôle comes pressure for better performance, and the first step to achieving better performance is understanding what the network traffic within them is actually doing. This talk gives introduces the concept of data centers and goes through some examples of traffic patterns. This talk will introduce a set of principles that will be useful in a wide variety of network design problems.

Submit 4pm Saturday before talk.

How to write an abstract (2)

Most modern integrated circuits perform computations efficiently using synchronous (clocked) pipelines. These give a high throughput by exploiting parallelism. The synchronous framework gives desirable design semantics in most cases, but has some inconvenient properties which make some problems difficult to solve, and occasionally this results in an overly complicated control logic. A good example is a FIFO between two different clock domains.

This talk explores the asynchronous computation framework, from the basic ideas through transistor-level implementations of basic control structures to complex control blocks, that make for extremely easy-to-read circuit diagrams resembling flowcharts. We will also discuss the main trade-offs involved in asynchronous circuit design.

How to write an apology email

To: speaker
cc: chucompstalks-admins@srcf.net
Time: at least 24 hours before start of talk
Subject: <insert here>
Body: <personalised message here>

How to ask for help

- ▶ Things we are here to help you with:
 - ▶ Checking the scope and structure of your talk.
 - ▶ Conceptual understanding of topics.
 - ▶ Additional reading material.
 - ▶ Supply of datasets, in some cases, at least.
 - ▶ Rehearsals.
- ▶ **High-level input.** Helping you make connections and understand the context. Actual preparation is still down to you.
- ▶ It's up to you to make the best use of us. We can't understand the material for you.

Contact should usually be initiated by you in the first instance.

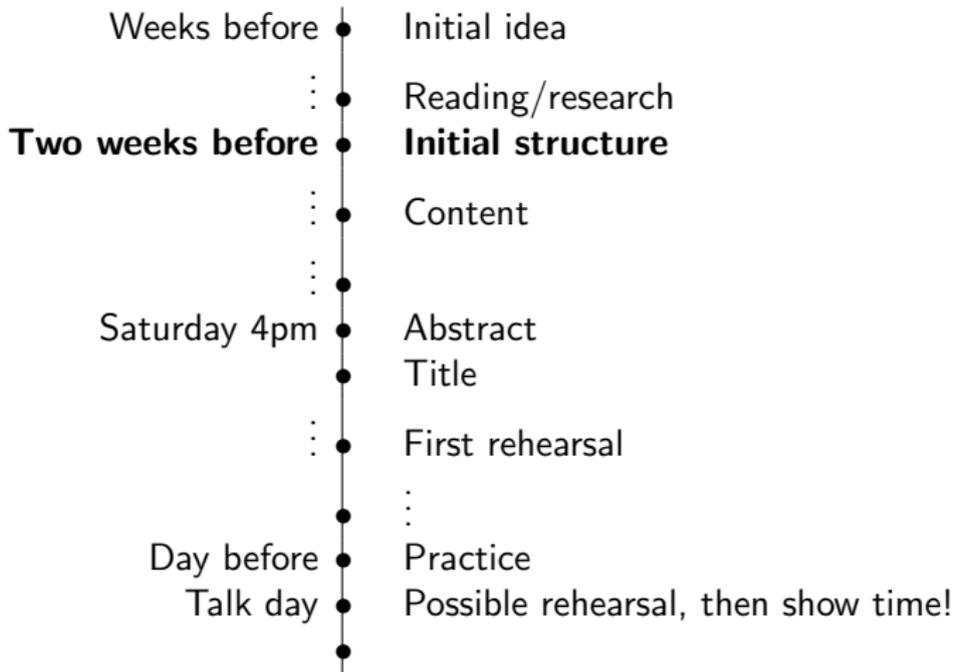
How to find inspiration

- ▶ <http://talks.cam.ac.uk/show/index/15345>
 - ▶ Careful with older talks
- ▶ <https://www.youtube.com/channel/UCUyBk6W50KWUQRiQhP1Zhzg>
- ▶ Good examples of what we're after:
 - ▶ *Pass Go and collect \$200: how slot machines are advancing the state of the art in computer go AI* (Cheng Sun)
 - ▶ *Adaptive Filters* (Abhishek Chander)
 - ▶ *Where did that come from? An introduction to sound localisation* (Will Simmons)
 - ▶ *Randomised Computation* (Daria Dicu)

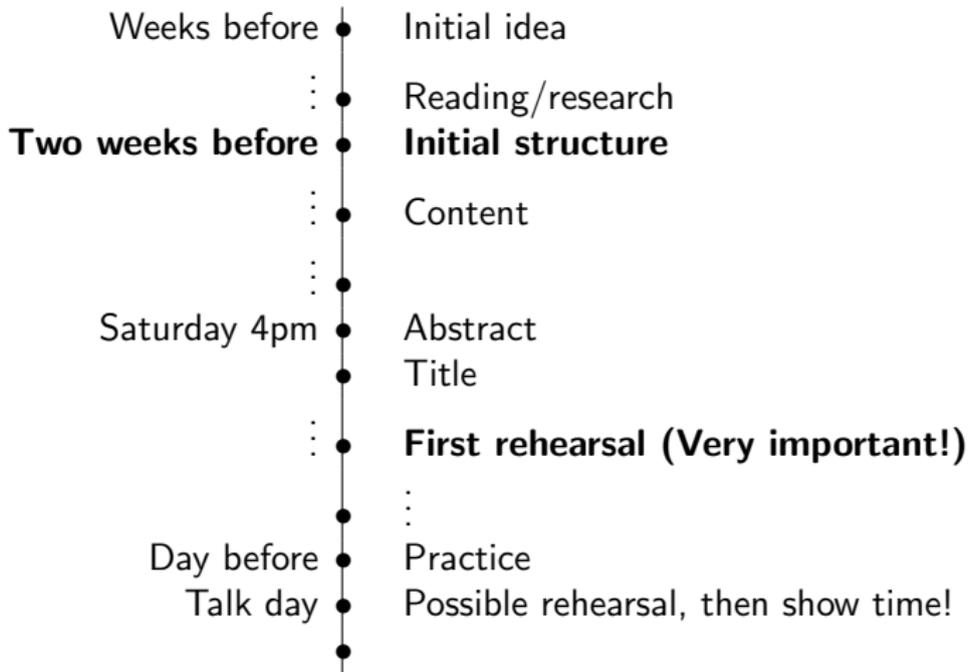
Schedule

- ▶ On KuDoS.

Timeline



Timeline



Conclusions

- ▶ Give a 25 minute talk in your assigned slot
- ▶ Start preparing early (this evening, if you like!)

Any questions?

Useful links:

<http://kudos.chu.cam.ac.uk>

<http://talks.cam.ac.uk/show/index/15345>

<https://www.youtube.com/channel/UCUyBk6W50KWUQRiQhP1Zhzg>