Goals of Tutorials

• Level M course → assessing critical thinking skills; ability to read research papers, extract key insights

• Tutorials intended to facilitate this:
  • To provide space to discuss the Further Reading highlighted at the end of the lectures in the previous week, to consolidate learning, and emphasise key points of the material
  • You are expected to have read the highlighted papers, and to come to the tutorial prepared to discuss the material
  • Write your own summaries of the papers: what are the key concepts and ideas? what isn’t clear? what’s unimportant detail?
  • Discuss material that isn’t clear in the tutorials → you’re not expected to understand everything in the papers
Reading Research Papers

• Was everyone able to access the papers?

• Experiences with the process of reading a research paper?
  • Critical reading of a research paper is difficult and requires practice; read in a structured manner, not end-to-end, think about the material as you go

• Did everyone take notes? Come with questions to discuss?
Discussion of Papers


- Systems programming: constrained memory, I/O performance, data representation, state matters

- Fallacies: factors of 1.5–2 don’t matter; boxed representation can be optimised; the optimiser can fix it; legacy issues insurmountable

- Suggests: annotating code to check application constraints

- Suggests: manual but automatically checked storage management; explicit control over data representation

- The BitC project wasn’t a success, but are the ideas valid?
Discussion of Papers


• Use of strongly-typed languages to build an operating system; software isolated processes; message passing – is this a sound basis for the system?

• Type-safe message passing through channels; checked state machines for communication protocols (e.g., to control device driver state) – useful tool to help ensure correctness, or over-complex and stifling?

• Small unsafe microkernel, with type-safe system layered above – can the microkernel be written in a safe language?

• Threads and exchange heap; garbage collection – overheads?

• Is the idea of running everything in a virtual machine reasonable?