# Conclusions

# What we have seen

- A theory of <span style="color:red">concurrent systems</span> (based on LTSs)
- A theory of <span style="color:red">real-time systems</span> (based on TAs)
- Correctness as a behavioural <span style="color:red">equivalence</span>
- Correctness as <span style="color:red">satisfaction</span> of temporal properties
- Model-based <span style="color:red">testing</span> and test synthesis
- Practical tools:
  - Uppaal
  - CADP (+ Testor)
  - CAAL (just a little bit)
- We have only <span style="color:red">scratched the surface</span> of FMs

# Other topics in FMs & Verification

- Software verification

  - prove correctness of "real-world" programs
  - (E.g. C, Java)

- Symbolic verification

  - Avoid explicit representations of the state space
  - Allows to verify systems with $10^{20}$ states & beyond

- Certified compilation

  - Write compilers that are provably free of bugs

# Further material

- Aceto, Ingólfsdóttir, Larsen and Srba, "Reactive Systems: Modelling, Specification and Verification". Cambridge University Press (2007). ISBN 9780521875462
  - CCS, behavioural equivalences, HML
  - Real-time systems with TCCS (a timed extension to CCS)

- De Nicola, "A gentle introduction to Process Algebras"
  - Manuscript, can be easily found online
  - CCS and several other PAs, behavioural equivalences