Design Verification COMS30026

WEEKLY STATUS UPDATE – W2

Kerstin Eder

Trustworthy Systems Lab

University of BRISTOL

Department of
COMPUTER SCIENCE

Topics W1

✓ Introduction to DV

✓ Verification Hierarchy

✓ Fundamentals of Simulation-based Verification

– Driving & Checking

Lab W1:

– get remote access to the EDA software

– teach yourself Verilog ☺

Paper review from W1

THE LIMITS OF CORRECTNESS[†]

Brian Cantwell Smith[*]

- *Identify the main lines of argument*
- *Why does the author question the notion of "correctness"?*
- *What are the two or three key take-away messages for you?*

Over the last ten years, the Defense Department has spent many millions of dollars on a new computer technology called "program verification" - a branch of computer science whose business, in its own terms, is to "prove programs correct". Pro-

And my answer, to give away one punch line, is no. For fundamental reasons - reasons that anyone can understand - there are inherent limitations to what can be proven about computers and computer programs. Although program verification is an important new technology, useful, like so many

Topics W2

- Verification Tools
- Hardware Design Languages (self study)
- Verification Cycle, Methodology & Plan

- **Lab W2:**

  – Introduction to ModelSim/Questa

    - installed on linux lab machines

  – Work through mux testbench from Exercise 2

    https://uobdv.github.io/Design-Verification/

Optional Activities – Week 2

- **Review the foretellix blog** *https://blog.foretellix.com/*

The Foretellix Blog

HOME   ABOUT ▾   WHY THIS BLOG   TERMINOLOGY   TOPICS   ALL POSTS

GPT-3 and verification

July 20, 2020

Summary: This post talks about GPT-3, a new Machine Learning (ML) system currently making waves in the ML community. It explains why GPT-3 is a big deal, and then considers the verification implications of such systems. One way to look at GPT-3 (and the even-bigger GPT-4, GPT-5 etc. which are sure to follow) is as …

More

Search …

Archives

Select Month ▾

RV2020 Keynote by Lane Desborough on
The Physical Side of Cyber-Physical Systems
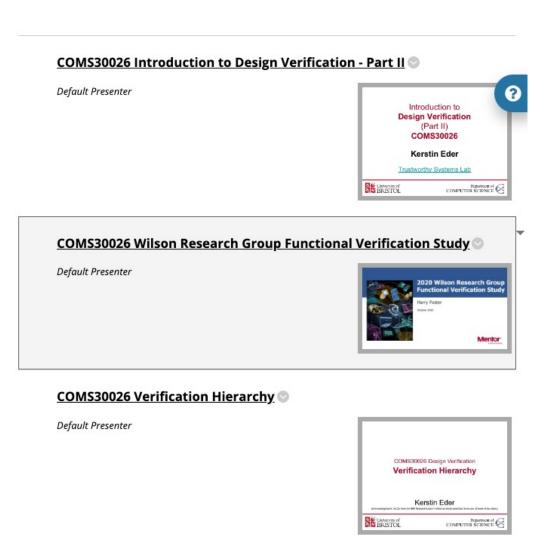https://youtu.be/QRknQBMK9LA?t=457

1. It is possible and valuable to cross domains

2. The future is already here, it just hasn't been evenly distributed yet. – William Gibson

3. Bad things can happen during mode transitions, when the state of the system is changing

4. Never forget that the physical side of cyber-physical systems involves energy

5. Manage variation using hierarchical, temporal decoupling

6. In cyber-physical systems, most any parameter can be a critical parameter … so manage them all carefully … if you don't manage change, change will manage you

7. "Open" Process Automation Systems are nearly impossible to comprehend

8. Interoperability is not a panacea

9. So simple there are obviously no errors, or so complex there are no obvious errors

10. Hardware, software, wetware, and the cyber-physical systems comprised thereof are different and should be treated as such

11. Systems: the bigger they are, the less frequent – but harder - they fall

12. Take on only as much complexity as you can manage – lives may be at stake

13. When our commercial reach exceeds our technical grasp, we must look for new approaches

14. Humans and computers are good at different things; improper task allocation creates problems

15. Automation changes the nature of use error: from acts of commission to acts of omission

16. The methods, tools, and processes to compose small, medium, and large systems are different

17. Emergent properties will emerge

18. The challenges with complexity have been known for a long time

19. That which you do not have does not cause problems

20. Complexity is easy to add hard to remove

21. Complexity adds cost, risk, and delay (and technical debt, and late cycle surprises)

22. All models are wrong, but some are useful – George Box

23. We build models to efficiently characterize what the system will do

24. Modeling is a means not an end; different kinds of modeling serve different purposes

25. One must be prepared to use as many characterizations methods as necessary

NUDGE

Opportunities – Week 2/3

- 2020 Wilson Research Group **Verification Survey Results**
  - Full recording by Harry Foster on Blackboard

Next

- **Recordings of lectures for Week 2:**
  - ✓ Driving & Checking (from last week)
  - ✓ Verification Tools
  - ✓ **Teach yourself Verilog**
  - ✓ Verification Cycle, Methodology & Plan

  – uobdv.github.io/Design-Verification/ shows a **weekly schedule of topics** to watch BEFORE the next session, ideally

  – Recordings are available from Blackboard unit page

- **Tasks for you this week:**
  – **Attend the lab session** with Xuan to get help with using ModelSim/Questa, then work through the mux testbench from Exercise 2 on https://uobdv.github.io/Design-Verification/

Questions

Demonstrably trustworthy systems for reliable, secure computing.

https://www.bristol.ac.uk/tsl