



Fall 14: Embedded/Cyberphysical System Verification

URL: <http://users.crhc.illinois.edu/mitras/ECE584/index.shtml>

Location: 3014 New ECE Building

Time: Tuesdays and Thursdays 11-12:20PM

Instructor: Prof. Sayan Mitra (mitras@illinois.edu)

What's it about? Look inside your car, in smart meters, in air-traffic control systems and you will find computers controlling physical processes. This course is about **rigorous** design and analysis of such cyberphysical systems. Learn to use powerful algorithmic and logical tools (model checkers, SMT solvers, & theorem provers), read and critique recent ideas from research papers.

The course meets twice a week, has 4-5 home works, and a **semester-long project**. All reading material will be available online. Projects typically lead to conference papers.

Topics include:

- Automata & languages, invariant proofs, linear systems
- Models for discrete time, synchronous, & asynchronous, distributed systems
- Temporal logics & model checking
- Hybrid system models, Lyapunov functions, bisimulation and simulation
- Abstraction and refinement
- Undecidability and limits of algorithmic verification
- Deductive verification with theorem provers
- Applications path planning in robotics, supervisory control, biology

Register today!

