Hsi-Ming Ho

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Research Interests

- Formal Verification, Real-Time Systems, Model Checking, Temporal Logics, Computational Complexity, Automata Theory, Theoretical Computer Science.

Education

- **University of Oxford**   **Oxford, United Kingdom**
  PhD, Computer Science   *2010 – 2015*
    - Thesis: Topics in Monitoring and Planning for Embedded Real-Time Systems
    - Supervisor: Prof Joël Ouaknine

- **National Taiwan University**   **Taipei, Taiwan**
  MS, Electrical Engineering   *2008 – 2010*
    - Thesis: On-the-Fly Strategy Construction in ATL Model-Checking
    - Supervisor: Prof Farn Wang

Research Projects

- **Quantitative Verification: From Model Checking to Model Measuring**
    - Developed efficient algorithms for offline path checking and implemented a prototype tool, which outperforms a state-of-the-art commercial product by an order of magnitude.

- **Expressiveness of Timed Logics** [1]
    - Obtained a strict hierarchy of metric temporal logics based on their expressiveness.
    - Proposed a set of new modalities which makes MTL expressively complete.

- **Runtime Verification of Real-Time Properties** [2]
    - Proved a separation theorem of MTL in the pointwise setting.
    - Proposed the first trace-length independent monitoring procedure for full MTL.

- **Route Planning of Unmanned Aerial Vehicles** [3, 4]
    - Settled the computational complexity of the problem (PSPACE-complete).
    - Developed a prototype tool based on SMT solving and antichains.

Publications

1. Hsi-Ming Ho. *On the Expressiveness of Metric Temporal Logic over Bounded Timed Words.* [RP 2014]
2. Hsi-Ming Ho, Joël Ouaknine and James Worrell. *Online Monitoring of Metric Temporal Logic.* [RV 2014]
3. Hsi-Ming Ho and Joël Ouaknine. *The CR-UAV Problem is PSPACE-Complete.* [FoSSaCS 2015]
4. Hsi-Ming Ho and Joël Ouaknine. *An Antichain Algorithm for the CR-UAV Problem.* [in preparation]

Technical Skills

Languages: C, C++, OCaml, x86 Assembly, Verilog, LaTeX