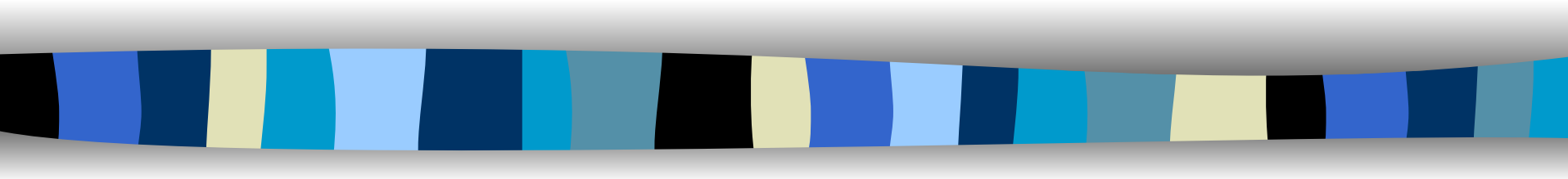
Concurrent Systems: Graph Model Synthesis & Transformation



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Key research

- Extracting Transition Systems from Java source
  - State-space reductions for model size
  - Analysis of shared variable ownership
- Deriving Petri Nets from Finite Transition Systems
  - Extended the class of synthesizable TSs
  - PN synthesis for an arbitrary TS, mapping a TS event into set of PN trans. labels

Key research 2

- Global assignment theory for encoding state graph transformations
  - Checking reduces to a bool SAT problem
- New internal design representation for codesign
  - Hierarchical, heterogeneous functions driven by state machines

Key Research 3

- Novel technique for synthesis of speed-independent circuits
  - –Efficient approximation using STG-unfolding segment

Open Problem

- Automated extraction of Petri Net representations from concurrent Java systems.

Topic-Reference Cross-Index

[1]: Extracting Transition Systems from Java Source

[2]: Deriving Petri Nets from Finite Transition Systems

[5]: Global Assignment Theory for Encoding State Graph Transformations

[4]: New Internal Design Representation for Codesign

[3]: Novel Technique for Synthesis of Speed-Independent Circuits

References

[1] J.C. Corbett, "Using Shape Analysis to Reduce Finite-State Models of Concurrent Java Programs," *ACM Transactions on Software Engineering and Methodology (TOSEM)*, vol. 9, no. 1, pp. 51–93, Jan. 2000.

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[3] A. Semenov , A. Yakovlev , E. Pastor , M. A. Peña , and J. Cortadella, "Synthesis of Speed-Independent Circuits from STG-unfolding Segment," *Proceedings of the 34th Annual Conference on Design Automation Conference*, pp. 16–21, June 1997.

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