Petri net based Async Design

with

Workcraft

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The role of Petri nets in design process

Why Petri nets (STGs)?
Because they have simple graphical capture, sufficient expressive power (concurrency, choice, and/or causality etc), yet rigorous formal semantics (state spaces, binary encoding, etc) to represent key properties such as liveness and safety (e.g. deadlocks, hazards, fairness).

Algorithmic Behaviour (CHP etc.)

Logic Circuit (netlist)

Layout (GDI)

Models: Petri nets (STG), State graphs

Synthesis, Transformation, Verification, Visualisation

Workcraft
Outline

Brief introduction on Petri nets (see separate handout)

Overview of the synthesis flow

- Specification
- State graph and next-state functions
- State encoding
- Implementability conditions
- Speed-independent circuit
- Decomposition of complex gate solutions
- (Relative) timing optimization

PLUS, throughout the talk we’ll use Workcraft
Book, papers and synthesis tools


Petrify and Workcraft: http://www.lsi.upc.es/petrify
- http://workcraft.org