

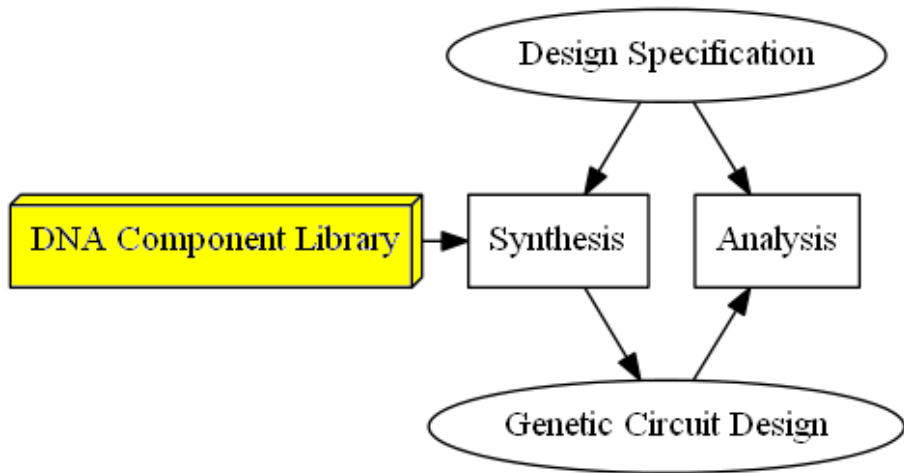
Directed Acyclic Graph-Based Technology Mapping of Genetic Circuits

Nicholas Roehner

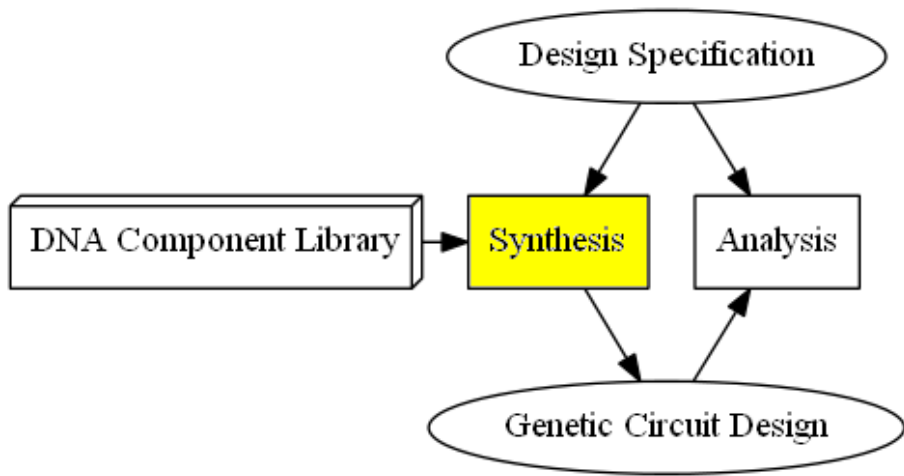
University of Utah

April 24, 2013

Genetic Design Automation: SBML-to-SBOL Library Construction

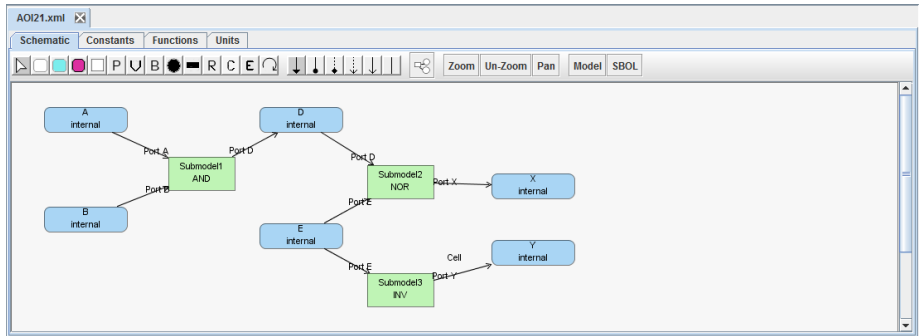


Genetic Design Automation: Genetic Technology Mapping

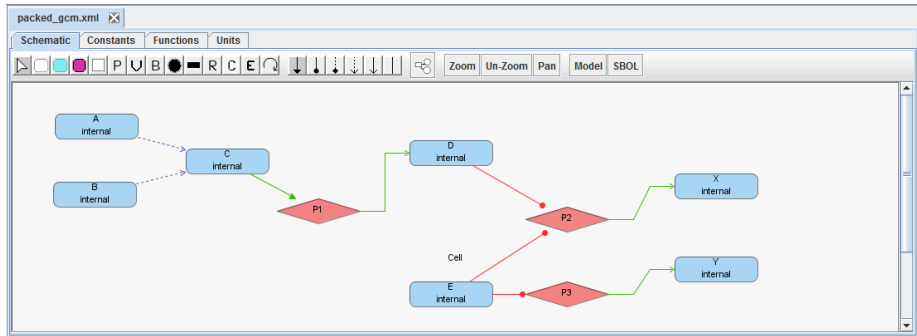


- 1 Partitioning
- 2 Decomposition
- 3 Matching
- 4 Covering

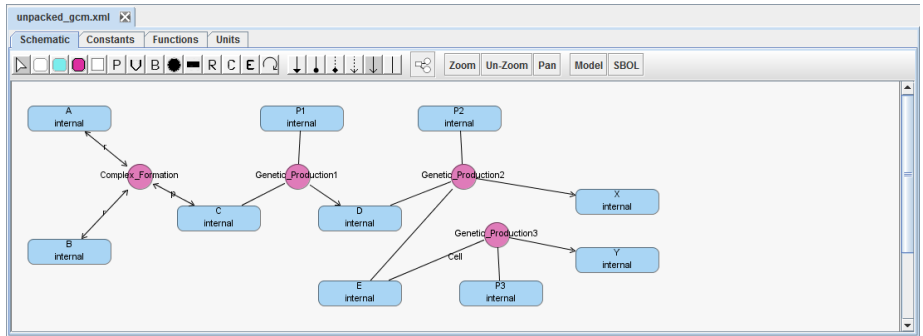
And-Or-Invert + Inverter in iBioSim



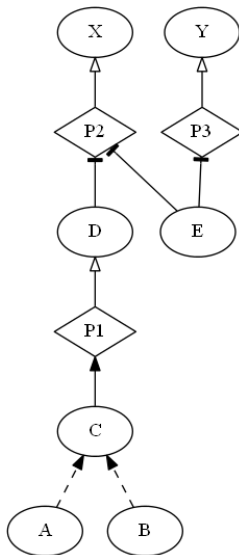
Genetic Circuit Model for AOI + INV



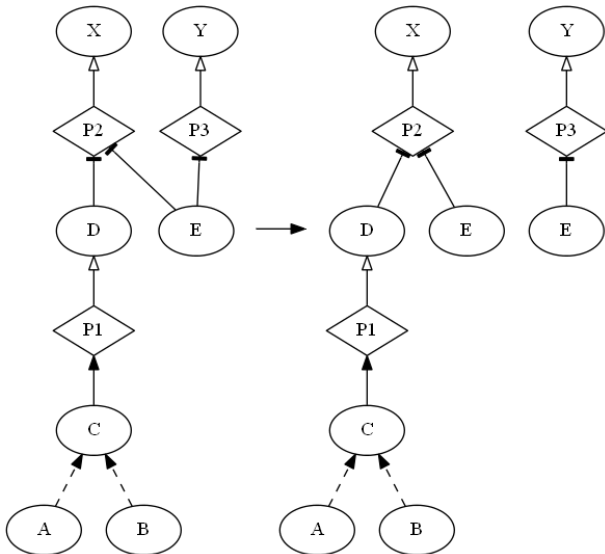
Raw SBML for AOI + INV



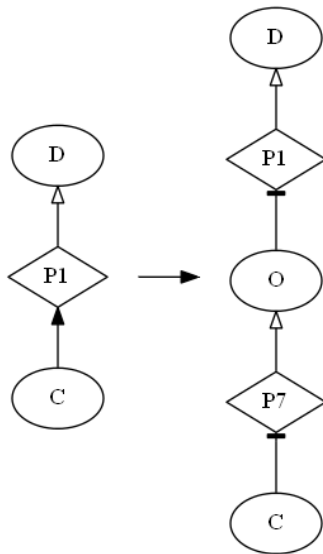
Regulatory DAG for AOI + INV



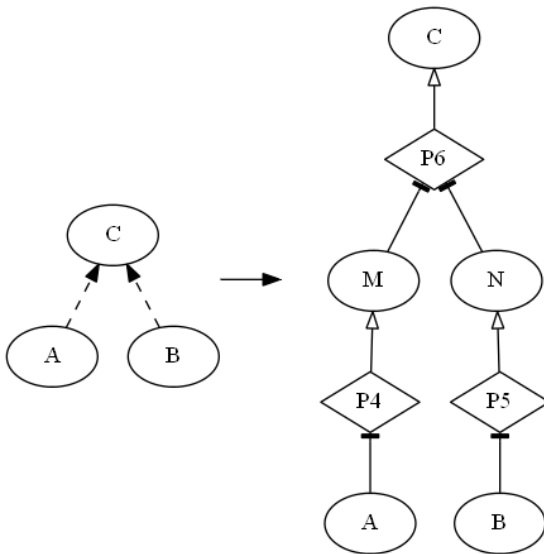
Partitioning



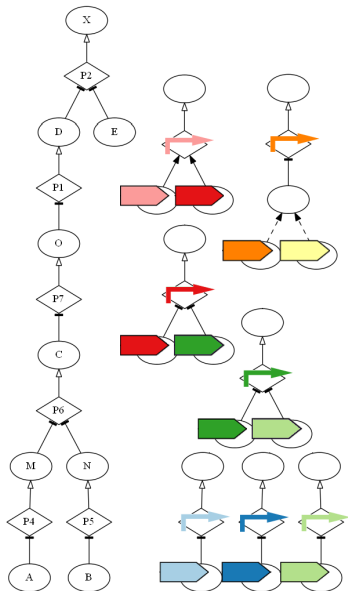
Decomposition



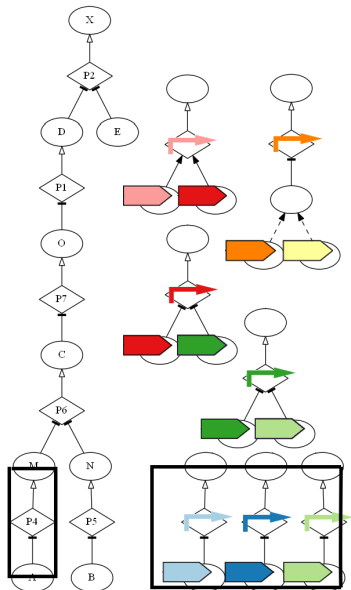
Decomposition



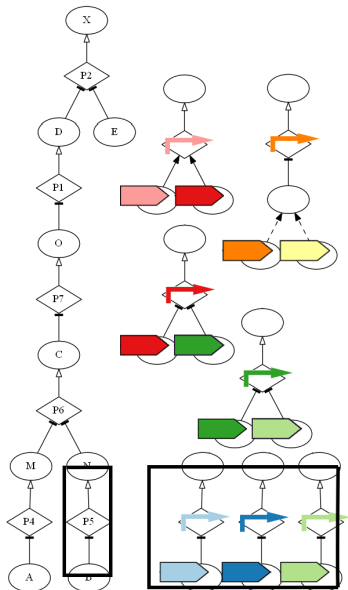
Matching



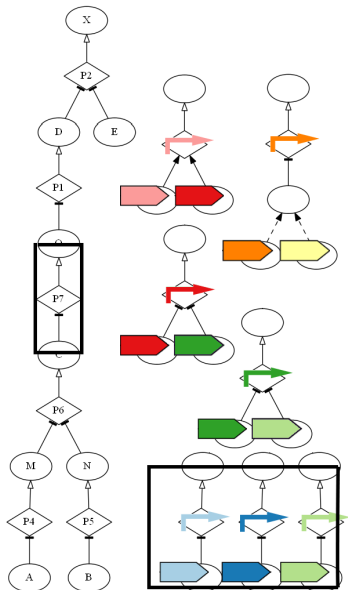
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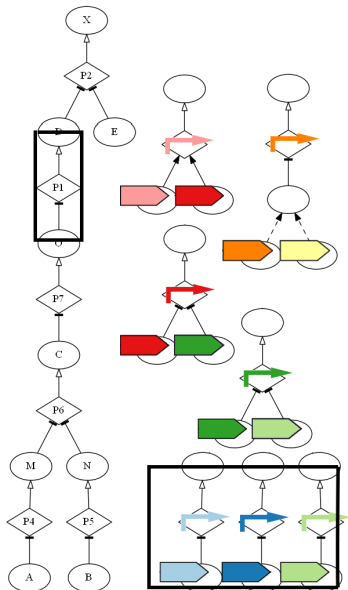
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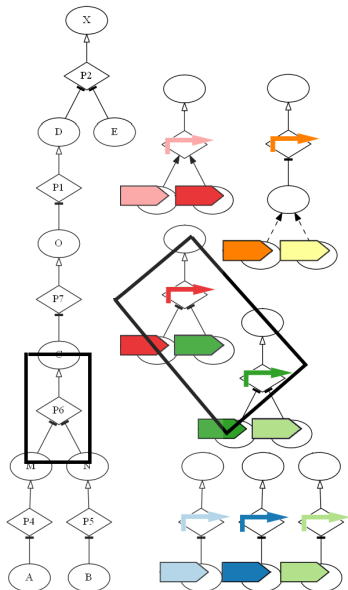
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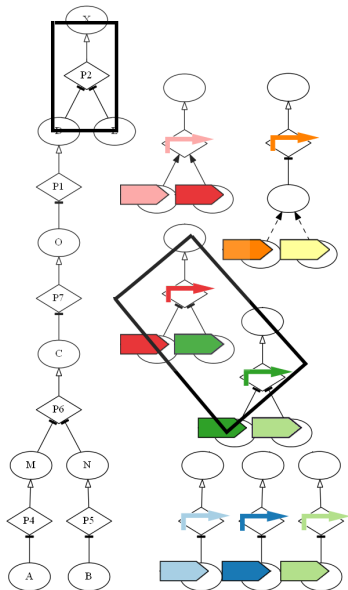
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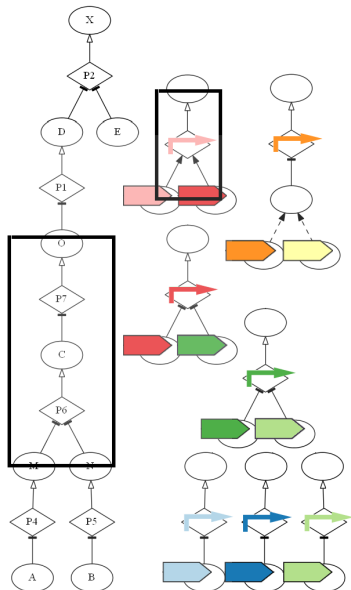
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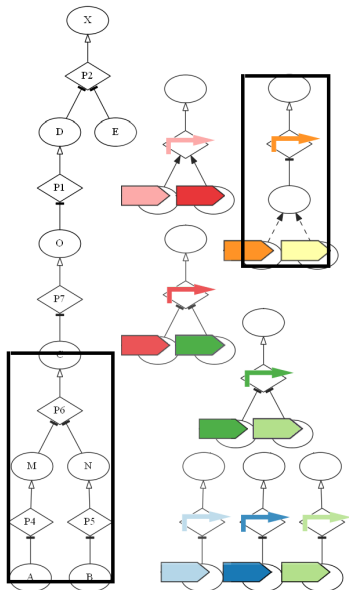
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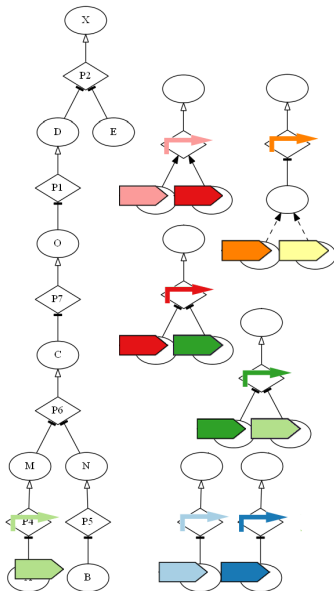
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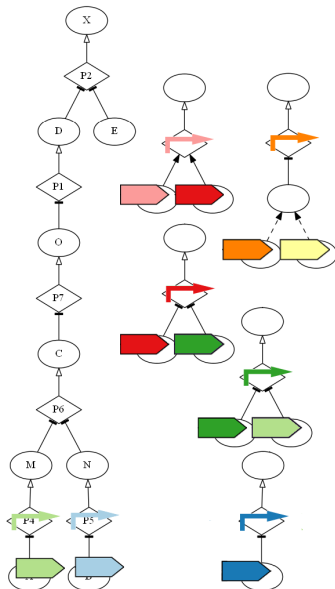
Matching



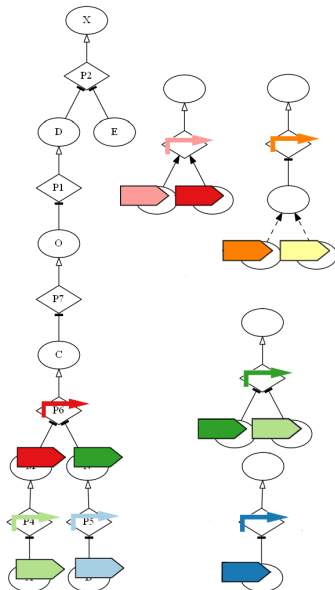
Covering



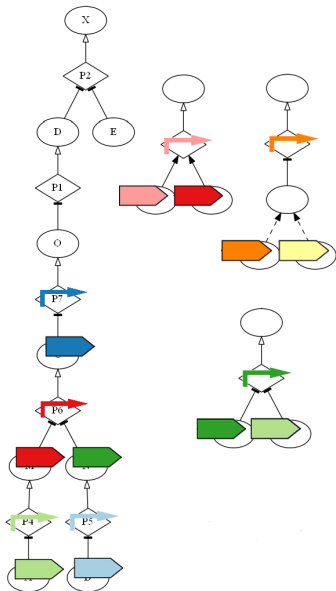
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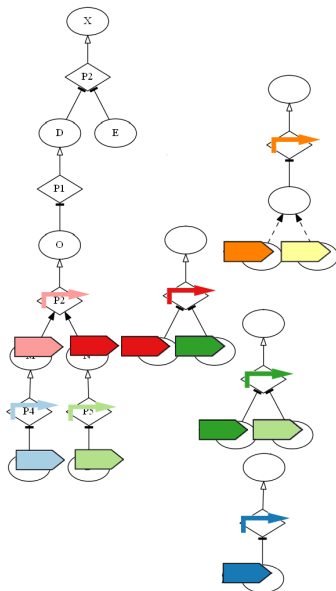
Covering



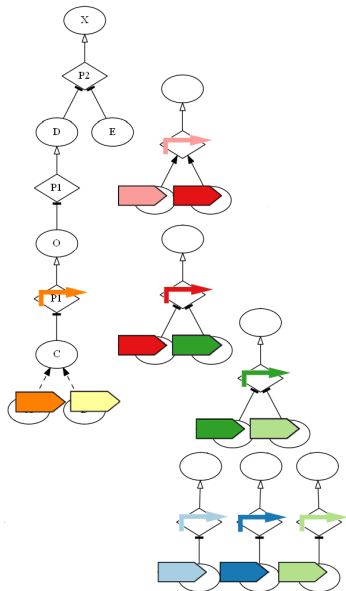
Covering



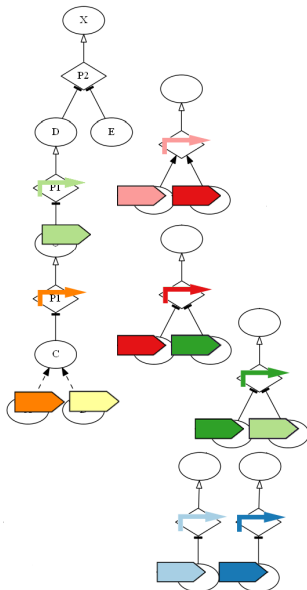
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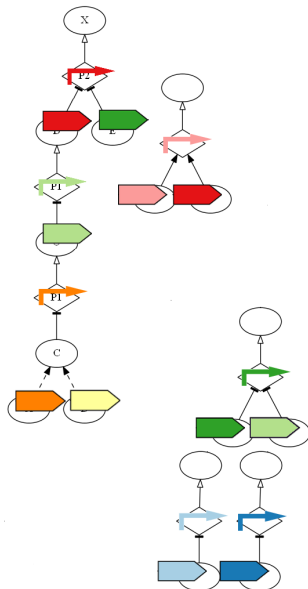
Covering



Covering



Covering



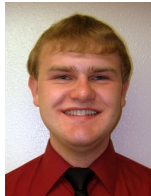
Future Work

- Methods for handling cyclic regulatory graphs (i.e. feedback)
- Alternate methods for decomposition

Acknowledgments



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iBioSim is freely available for Windows, MacOS, and Fedora at <http://www.async.ece.utah.edu/>