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# Research in Supply Chain Engineering

## Peter O'Grady

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**Research covers improving the operations of supply chains. Research topics include:**

- Supply Chain Disruption Analysis
- Extended Kalman Filters for Collaborative Supply Chains
- Risk pooling in centralized and satellite warehouse facilities (with Caterpillar)
- Six Sigma in healthcare supply chain operations (with Mercy Hospital and VA Hospital)
- Improving managers decision making in supply chains (with Iowa State University)
- Supply chain inventory reductions for spares (with Rockwell-Collins)



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### •Supply Chain Disruption Analysis

- Use extended Petri Net approach to model a supply chain.
- For a given supply chain system with an initial marking  $T_0$ , the reachability set,  $R(T_0)$  is generated by enumerating all markings from  $T_0$ .
- Approach is able to model how changes disseminate through a supply chain system and calculate the impact of the attributes, without an extensive computation burden.



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### •Extended Kalman Filters for Collaborative Supply Chains

- Inaccurate estimates of the state of the supply chain system can lead to incorrect decisions
- This work combines an extended Kalman Filter with a network approach that models the supply chain as an abstraction.
- Aim to obtain an improved estimation of the state of a supply chain system