

Anomaly Detection

Panel: The Current State of Artificial Intelligence

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Anomaly Detection

- Application:
 - Environmental monitoring [e.g. Dereszynski, E. and Dietterich, T. (2007). Probabilistic Models for Anomaly Detection in Remote Sensor Data Streams, In Proceedings of Uncertainty in Artificial Intelligence, 75-82]
 - Distinguish sensor failures from valid data
- Data:
 - Multivariate continuous time series
 - Some labeled data for known sensor failure cases
- Algorithm:
 - Dynamic Bayesian Network: baseline plus a first-order Markov process

Anomaly Detection

Application to Wireless Spectrum

- Opportunities:
 - Deals with temporal data
 - Can model correlations between time series
 - Can incorporate domain knowledge of expected behavior
- Issues:
 - May not be computationally efficient enough for wireless spectrum domain
 - Statistically rare instances are not necessarily meaningful anomalies
 - How to explain anomalies found?

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