

# AMiDST TOOLBOX

Session 5: Streaming data, Scalable Learning  
and Temporal Models with the AMIDST Toolbox

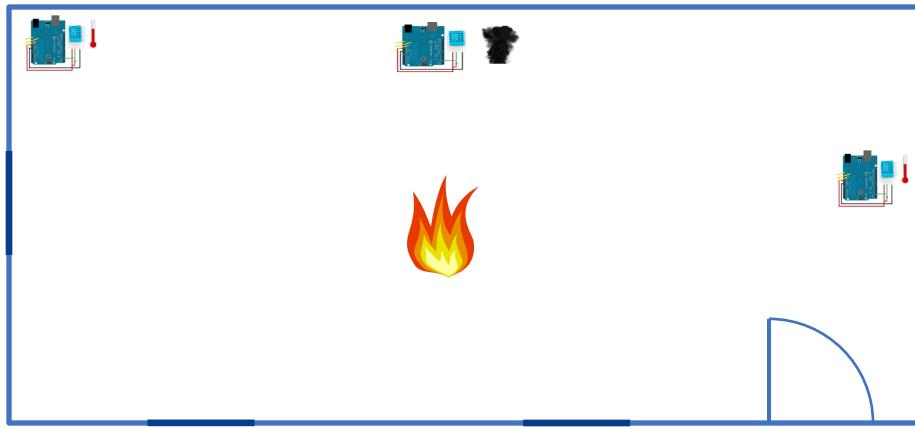
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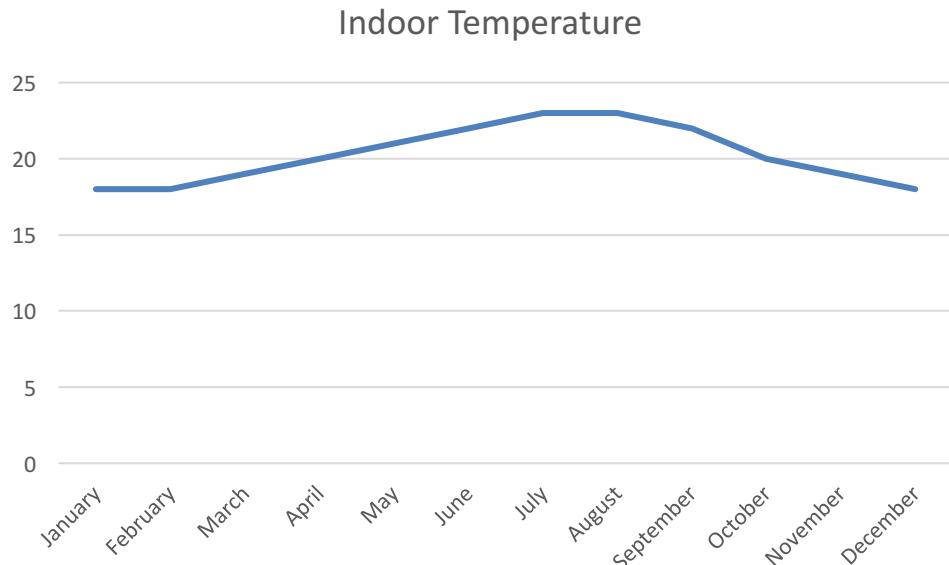
# Learning from Data Streams



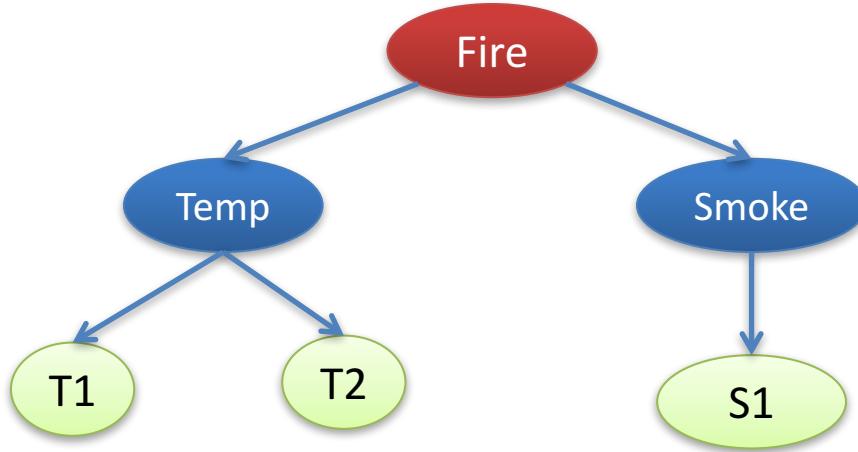
## Fire Detection from smoke and temperature sensors



- Data Collected
  - Tons of observations in normal settings (no fire).
  - No observations in the presence of fire.



- Baseline Indoor Temperature
  - Temperature fluctuates over the year.
  - Fire Detector Model should be adjusted.
  - Data Stream Settings (with concept drift).

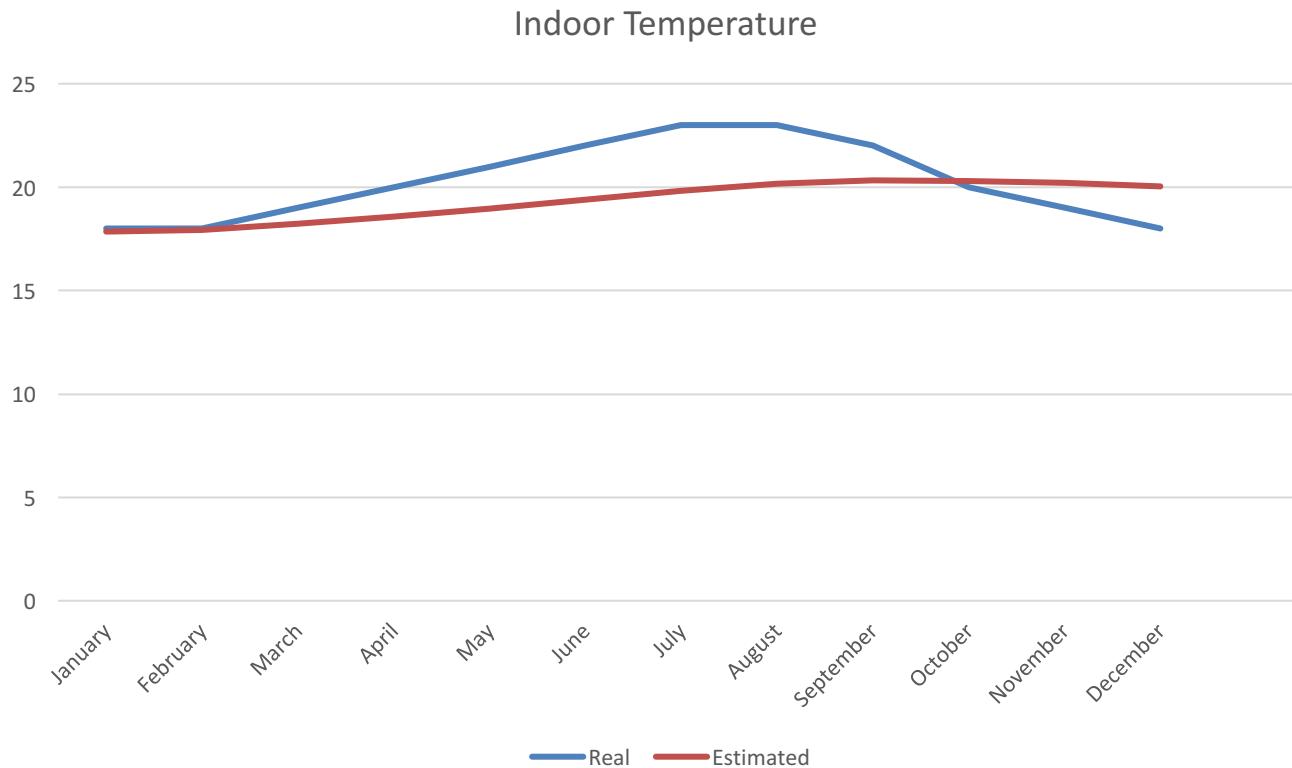


Update the model from a data stream

Continuous model updating

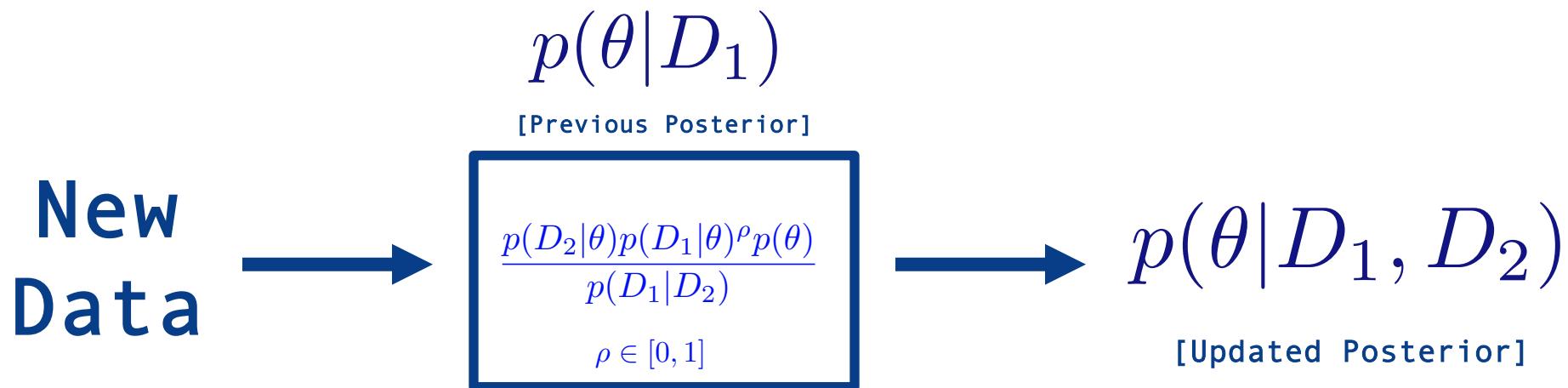
Code: Session5.A\_ModelUpdating.java





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Bayes Theorem  
[Exponential Forgetting]

- Old-data is exponentially down-weighted.
  - Forgetting Mechanism. Focus on the present.

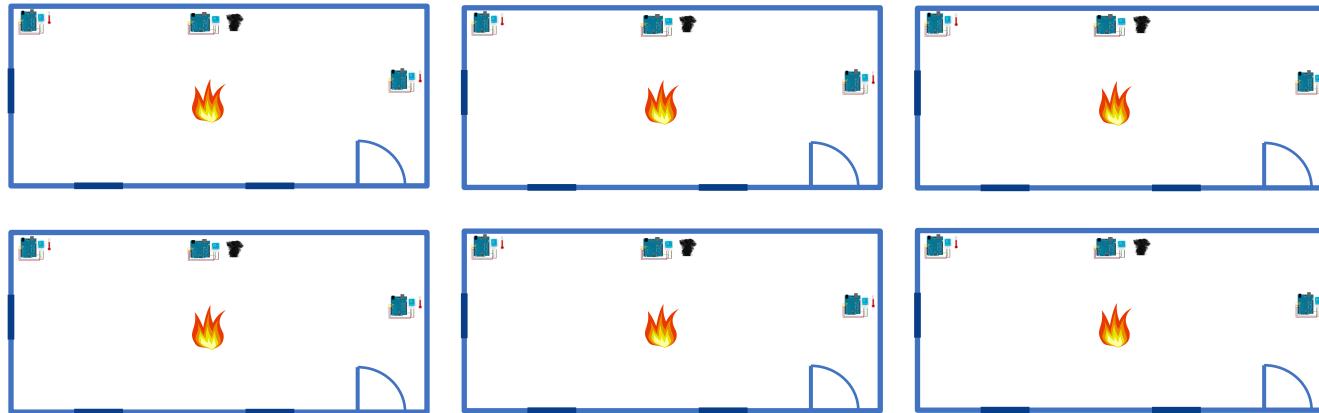
Code: Session5.A\_ModelUpdatingConceptDrift.java



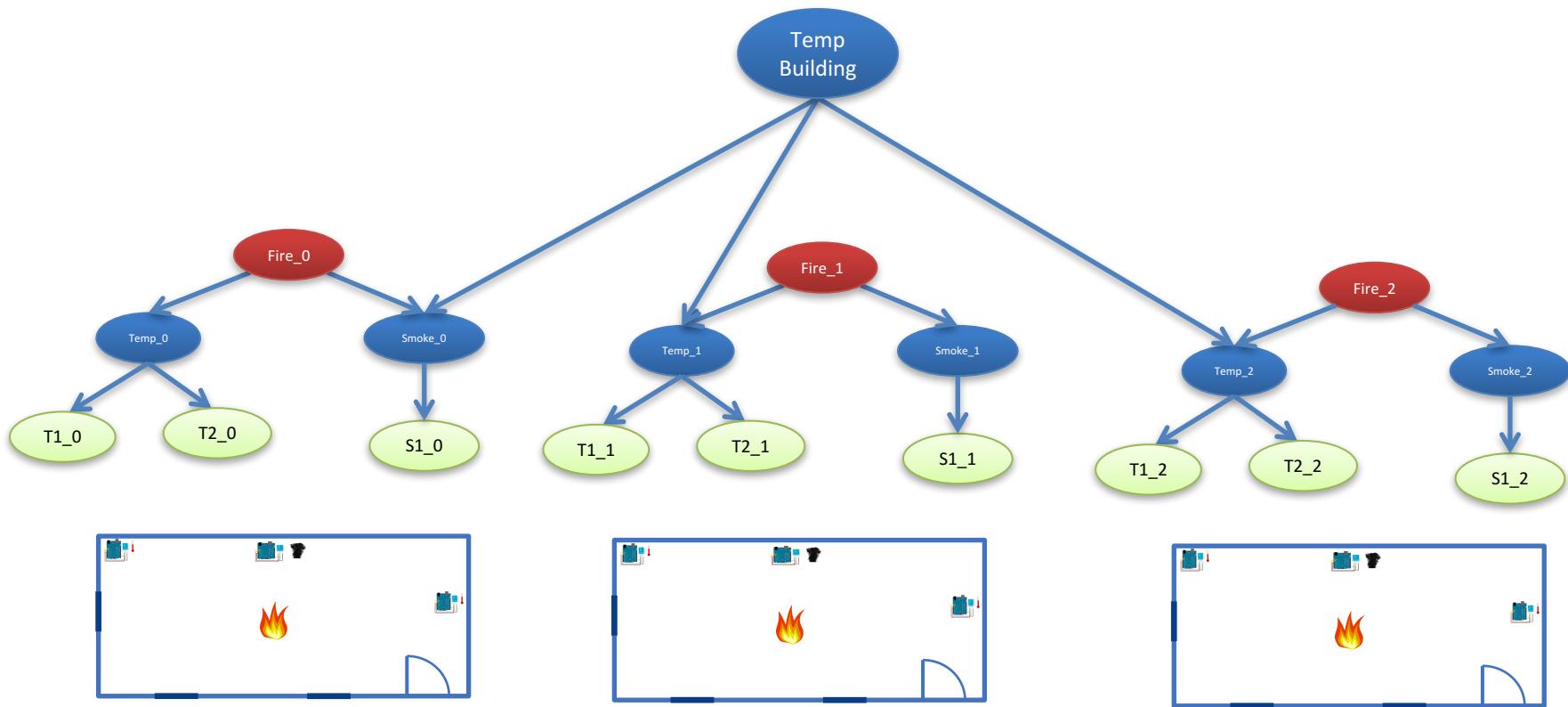
# Scalable Learning



## Fire Detection in a group of rooms



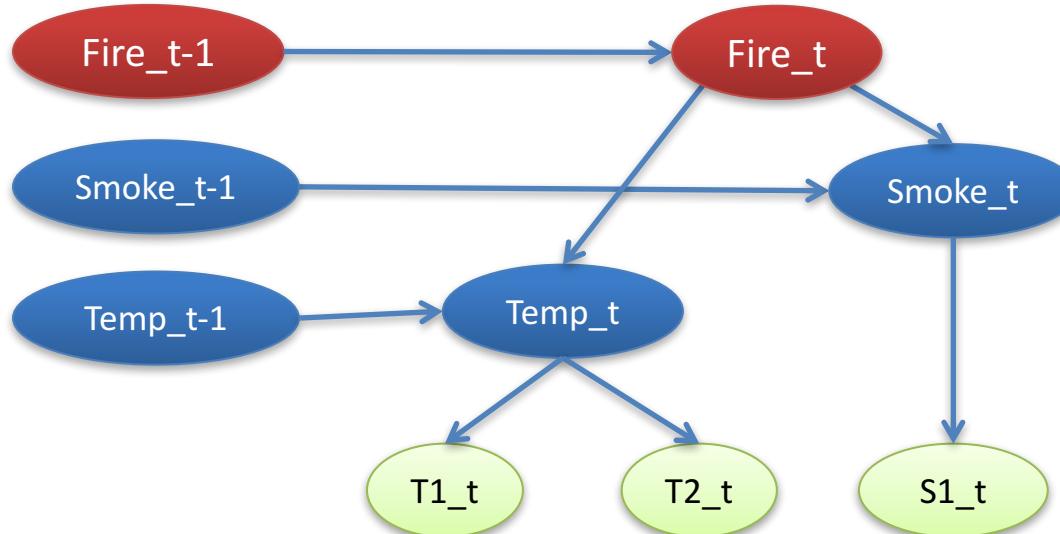
- Fire Detection in a building
  - Fire can happen in any room
  - All rooms share similar indoor temperature



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# Temporal Models





## Encode Temporal Relationships

Temperature tends to be constant.

# Thanks for your attention

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