Challenges for Sensornet Programming

NSF NeTS NOSS PI Meeting

Steven Cheung

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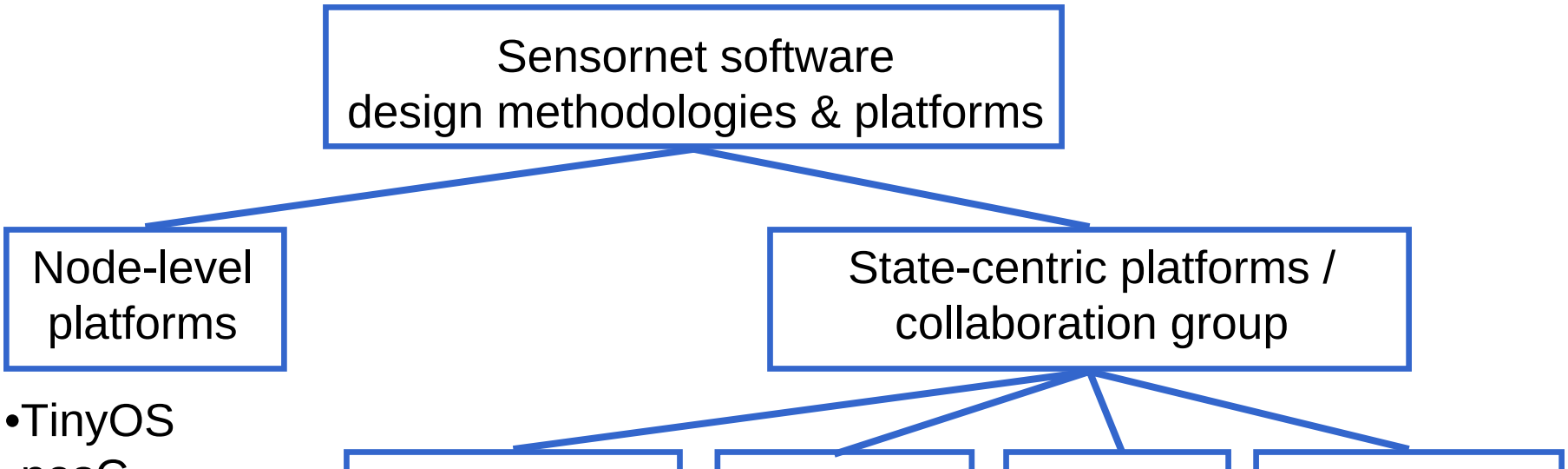
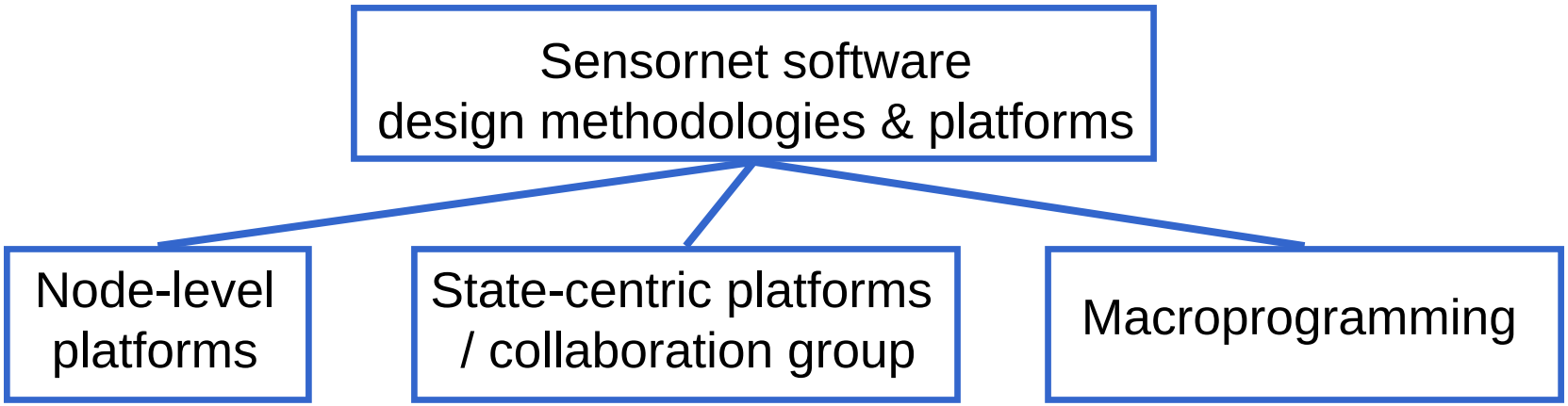
Zhao-Guibas taxonomy



Zhao-Guibas taxonomy ++



- TinyDB
- Cougar
- Regiment
- Kairos

Observations

- Time and location information are important for sensor network applications, but identities of nodes that generate data are not
- Significant progress has been made in sensornet programming, especially for some applications (e.g., querying sensors for data)
- Apparent tradeoffs among abstraction level, expressiveness, and efficiency of programming platforms
- → domain-specific programming platforms?

Challenges

- Scalability
  - How well does the program perform for a large (say 10k-node) sensor net?
  - Support for heterogeneous sensor net
- Dynamics of sensor networks
  - Nodes that “come and go”
  - How to develop robust programs?
- Tradeoffs among resource usage, reliability, system lifetime, security, costs, …
  - TinyDB (adjusting sampling frequency based on system lifetime) and abstract region (accuracy vs resource usage)
- Quality of service