

Uncertainty in Computation Experience

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workshop on Uncertainty in Computation

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Session 4: learning from experience

Identify **existing use-cases** that demonstrate successful approaches for working with uncertainty in computation, describe **guiding principles** that generalize across these examples, compare and contrast different types of approaches, and highlight key **open problems** that need to be addressed in order to more effectively deal with uncertainty in computation in different types of settings.

- Discussion Leader: Joanne Wendelberger

Existing Use Cases/Success Stories

- Meteorology
- Climate developing
- Geological – mining and petroleum
- Environmental modeling
- Supply chain modeling
- Sports statistics
- Election prediction
- Engineering Modeling

Factors for Success

- Open Problems
- Community
- Data available, in particular validation data
- Competition (friendly)
- Models and data are shared
- Having feedback

Challenges

- Representation and Communication of Uncertainty that carries through computations
- Extreme/Rare Behavior
- Abrupt behavior, tipping points
- Data storage/access/retrieval for diverse data (e.g. space-time)
- Efficient Computation/Processing
- Bring in shared infrastructure – data, info
- Data availability (usable, timely)
- Validation
- Address mismatch in predictions and data.