Uncertainty in Computation Experience

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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.