Models

Multiple types of model
- Prescriptive (how to build machines)
- Descriptive (how to design algorithms/Software)
  how does the user “think parallel”

We will focus on descriptive models.
Models

In descriptive model key goal is to preserve “order” among algorithms, exact costs is not so important.

– The purpose is to give guidance to the programmer not cycle accurate times.
– Order of magnitude accurate predictions might be sufficient
Models

Probably need multiple levels of models with mappings between them:

– Preserve Costs
– Preserve Correctness
– Lower models could be prescriptive models

Don’t take models too seriously:

– Good algorithms should be robust across reasonable models
Models

Energy :

– need to focus on data movement.
– Perhaps can piggyback on locality-aware models

Resilience : two ways to deal with it

– Support reliable abstract model on unreliable substrate (e.g. map-reduce). Put it into the mapping between models.
– Expose unreliability to the user...not clear how to do this.

Modeling failures is itself useful