Languages and Concepts

Approach

- Define research areas that should be investigated
- Bridge disciplines as much as possible
- Axiom for group: Definition of run-time model
  - An abstraction at a higher level of representation than code that is used to derive adaptation through monitoring and feedback mechanisms

Do We Need Specialized Notation?

- Are certain languages more amenable to use at runtime?
- How is feedback incorporated?
- Models as a higher level interface for adaptation
  - Balancing abstractness and concreteness – can you use a very abstract model?
- We barely get static systems right…why are we trying to do adaptive systems?
- Can you extend and use existing languages?
- Multiple views or layers of the same model
- What are the aspects of adaptation that need to be captured?

Models@runtime Usecases?

- Model-based recovery
  - Not perfect – but sufficiently correct (what is sufficient)
- System management
- Models for feedback
- Models for manipulating variability
- Determining what instrumentation to generate
- Models as an interface to a system rather than code manipulation

Applying Existing Technologies

- Aspects/interceptors are important for adaptation
- Using traceability to understand adaptation and ensure goals are met
  - Lazy traceability….traceability only when you need it
  - How many layers/views do you need?
- Constraint logic programming
- Control theory
- Model checking techniques

Representing Adaptation in Models

- Views (horizontal) – must be kept consistent across the views
  - Structural
  - Property
  - Deployment
  - Adaptivity
- Views (vertical) – must be kept consistent across
  - Requirements
  - Architecture
  - Execution view
- Need for reflection of dynamics all the way

Future Thoughts

- Changing the interpretation at the meta-level?
- What if the models are purely interpreted?
  - How do you adapt without sacrificing performance

Help from other disciplines

- Product Lines ? Variability management
  - Invariants as contrains
- Reflection: what to learn from them? To change semantics, meaning dynamically
- Agent-based programming, emerging behaviour
- AI Artificial Intelligence (Bio-inspired)