



PLEASE2013

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Products as Product Lines

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Contact Profile

- **Focus/interests**
 - requirements variability
 - product family verification methods
 - AE environments
- **Objectives / Looking for**
 - updates on recent PL activity
 - engagement with other PL investigators
 - insights from other PL experiences

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Product Line

- Scope: A single evolving product
- PL factors
 - Requirements uncertainties and unknowns
 - Prospective/future changes
- Wild card: Potential for other customers

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The Problem

- Any product resolves variability
 - requirements uncertainty
 - engineering tradeoffs
 - past and potential changes
- Differing resolutions correspond to different products
- The set of conceivable products form a family
- Failure to formulate the family leads to undisciplined change

Requested product: a distributed network of motion sensors

Challenges:

- account for different motion sensors?
- account for alternate sensor types?
- account for a mix of sensors?
- geographic scale, environmental conditions?

Current Solution

- Greater confidence in solution from systematic variability-oriented analysis of alternatives
- Roadmap for making potential changes
- Faster response as understanding of needs changes
- Design integrity maintained as changes occur
- Cost/benefit varies with level of investment
- Basis for evolving to a multi-product PL for this or other customers

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Why is it interesting?

- Avoids developer premature fix on “the” problem and its solution, with “changes” in the problem leading to destabilizing changes to the solution
- Stimulates capture of requirements and design rationale
- Subordinates component/code level focus that fosters unconstrained/poorly motivated variability
- Motivates tool building that expedites AE
- Provides starting point for a PL transition strategy

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Discussion

- How working in from customer-level variability to define a viable problem-solution space promotes both discipline and flexibility
- Why not to conflate product family (an evolving theoretical construct) and product line (a concrete realization in products)
- The cost question: why PLs require more investment (hint: achieving higher enterprise quality and productivity) but not necessarily “up front”
- Selectively applying PL techniques to a product

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Potential Collaborations

adaptable requirements

- variability, not a blank slate
- are needs easily buildable or a challenge?

product family verification

- testing as means or as scope
- reviews and formal methods

tools for AE

- representing a product family (models)
- producing complete products (methods)

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