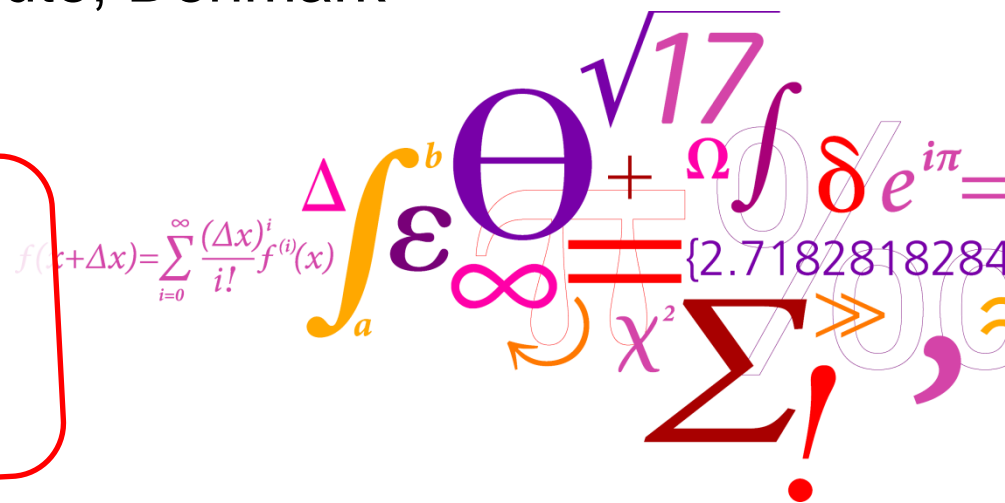# Bx Shonan 2016: Work group result
Adequate synchronization of models after model concurrent changes

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Synchronization =
    making models
    consistent again

$$f(x+\Delta x)=\sum_{i=0}^{\infty}\frac{(\Delta x)^i}{i!}f^{(i)}(x)$$

$\Delta \quad \int_a^b \quad \varepsilon \quad \theta \quad \sqrt{17} \quad \Omega \int \quad \delta \quad e^{i\pi}= \quad \infty \quad \{2.7182818284 \quad \chi^2 \quad \sum \quad !$

Consistency relation $R \subseteq M \times N$

- requirements on R

- internal consistencies $M' \subseteq M$, $N' \subseteq N$

General agreement:
Not much theory yet!
But, short presentation
of Yingfei's approach.

Even for two models: different approachs
- $\vec{R}: M \times N \to N$
- $\vec{R}: M \times N \to R$
- $\vec{R}: M \times N \to 2^R$

- ...

- Do we need $\vec{R}$ at all?

Ekkart will initiate the processes of writing a report general framework. People who want to contribute, please, contact, Ekkart.

General setting

- How to formulate consistency for multiple models?
  - globally (one big n-ary relation)
  - locally (many binary ones)

  Probably both needed!

- What does/can actually change?
  - Models: M, N
  - correspondences
  - consistency relation R   Yes?!
  - ...

- What are the factors/measures for resolving non-determinism (in a least suprise way)?
    - History / deltas (weighted history)
    - Traces
    - correspondences
    - **Role / authority in development process**

BTW: There does not seem to be a commonly understood terminology what traces and alignments are

Observations

Points discussed:

How to quantify the level of inconsistency?

- Consistency has shades!

- Inconsistency does not always need to be resolved immediately.

- Ultimately "the engineer decides what is" consistent

- Important: Conflict detection and helping the engineer to understand it; resolution can be delegated to engineer.

Challenges

- Is they a lense way of formalizing synchronizations

- Convincing example that some consistency notations cannot adequately be decomposed into binary consistency relations

"Andy's" Feature model, UC model, and class diagram example might be it?! See web pages.

Other good concrete examples welcome!

Possible results

Application scenarios / Examples

- Hao's collective model

- Andy's non-binary example (see previous slide)

- Ekkarts: "theoretical example" showing that multiple consistency relations are more tricky that only onw

- MDA: CIM PIM PSM (with only partially translating some elements/features back!)

Possible results

- Issues and problem
  → see observation and challenges

- Conceptual framework agnostic wrt. "approach"
  → join the work on the report (contact Ekkart)