Deutsche Forschungsgemeinschaft DFG

Abstract Interactor Model Multimodal Interactor Mapping Model Specifications

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Basic Question

How to model Interactions that span Modes and Media for the Web?

Why modeling?

- One (visual) language that
  - is declarative and precise to discuss & execute multimodal (web) interfaces
  - Is located between Tool and Code
  - Supports different forms of interaction and flexible multimodal prototyping
  - Paradigm design
  - Post-WIMP Interfaces

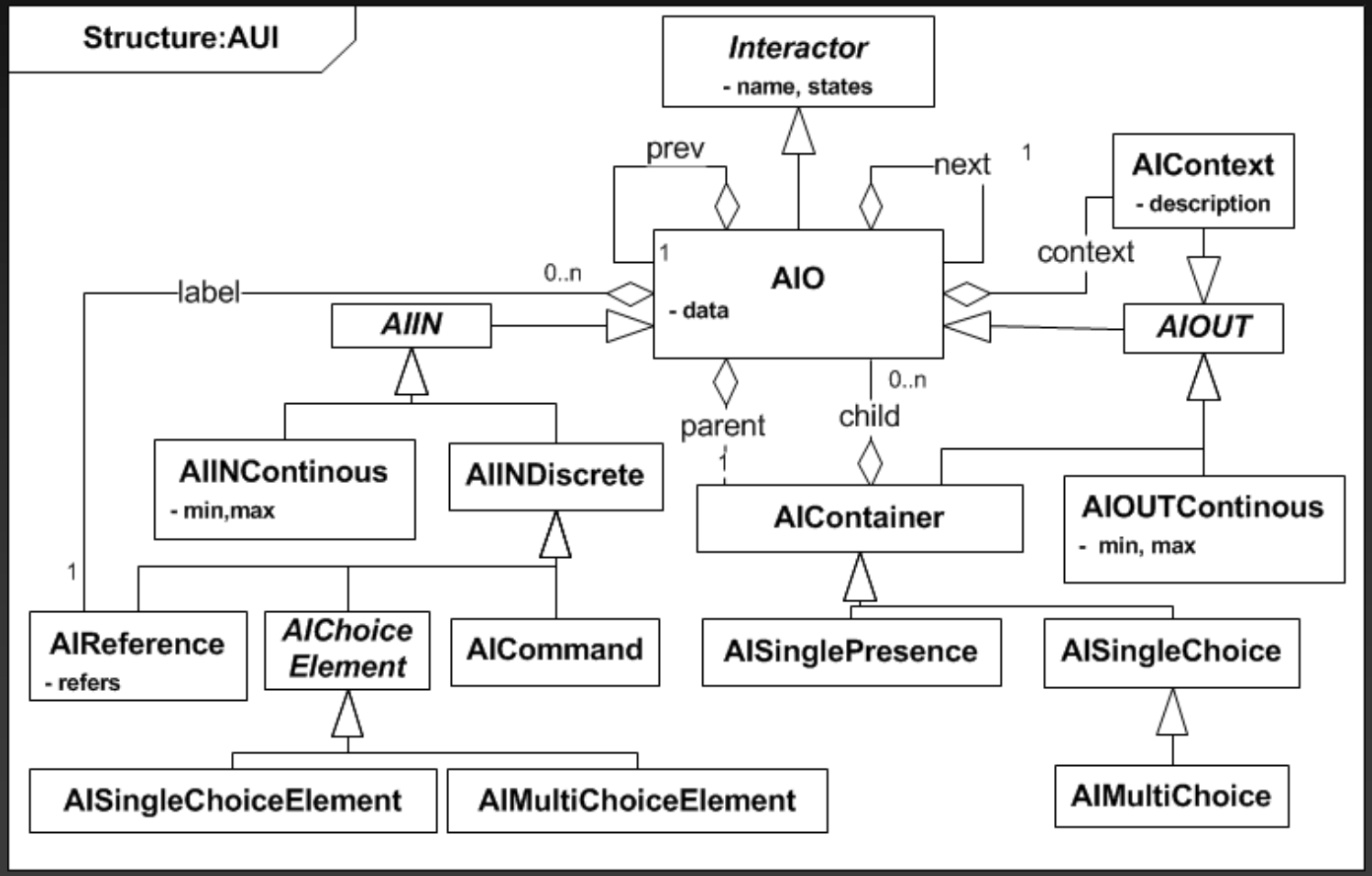
What is Out of scope ?

- No transformations, no process
  - Instead:
    - Interactor design (Multimodal \ Post WIMP)
    - Interactor assembly like GUI building with Mappings
  - System Design vs. Application Design
- Tools
  - Visual language -> Tool support

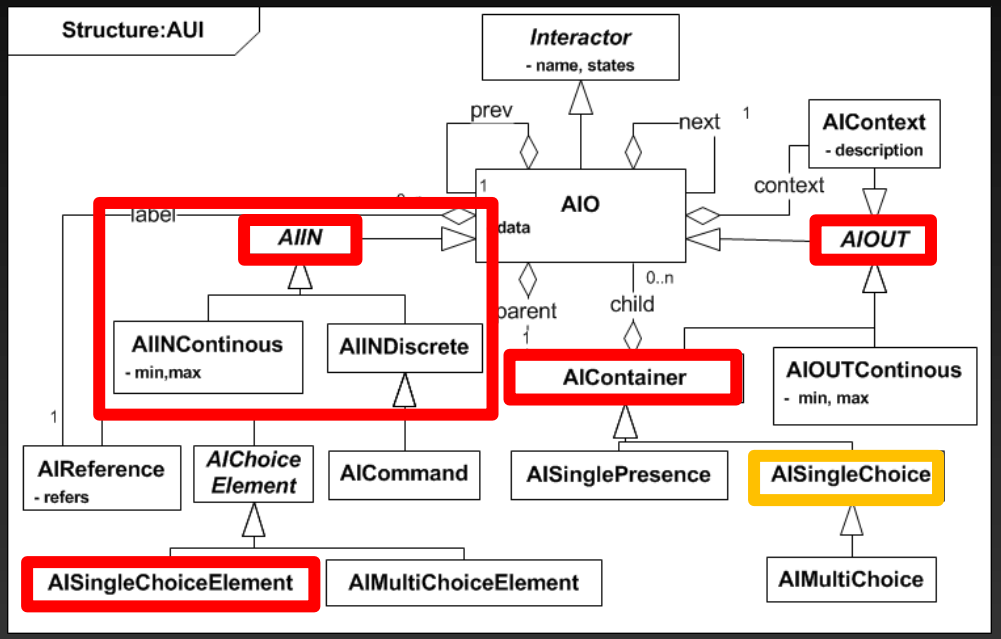
How to model?

- Models
  - Interactors (Abstract & Concrete Media, Mode)
    - Static: class diagram, Behavior: state-chart
  - Mappings Mode-To-Media Synchronization
    - Custom Notation

Abstract Model



Abstract Media Model



Single Choice

Aggregates a set of Entities from that only one can be chosen at a time

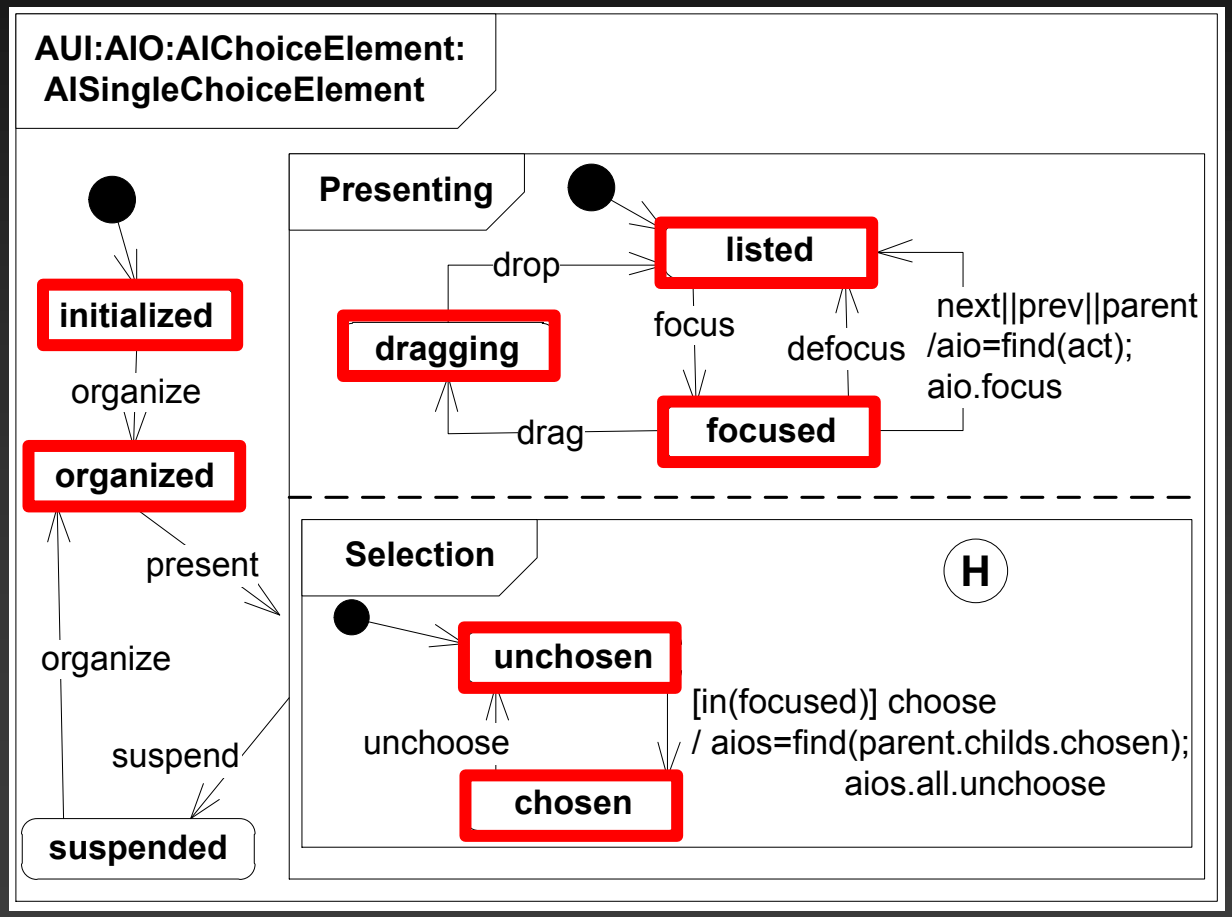
Examples: Direction (left or right)

Further Properties:

Container -> Aggregation, Discrete, Output to the User

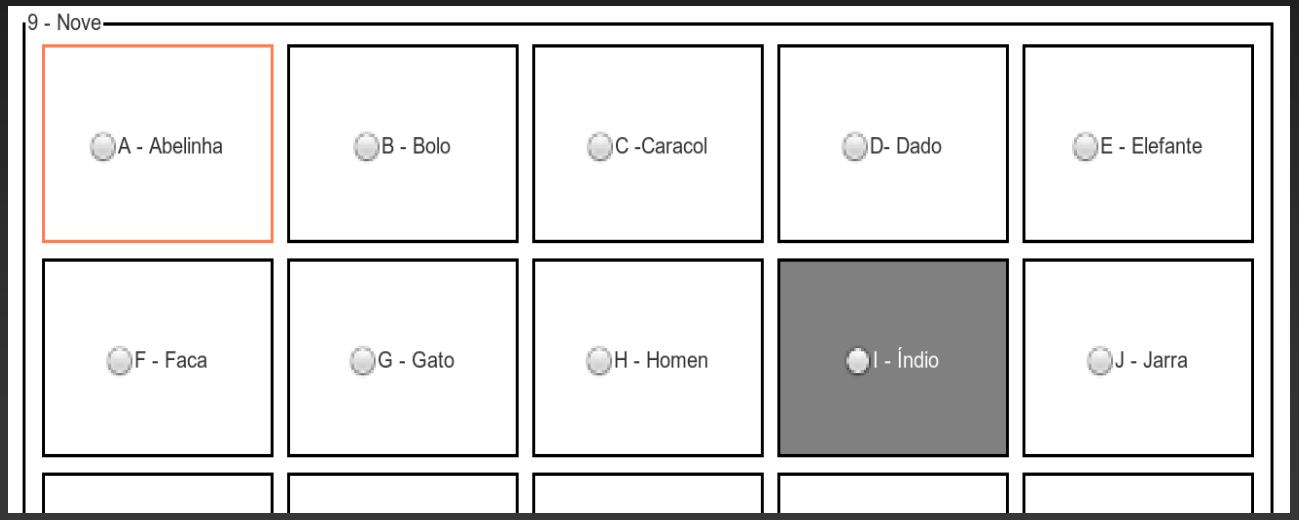
Contains Single Choice Elements that are Inputs

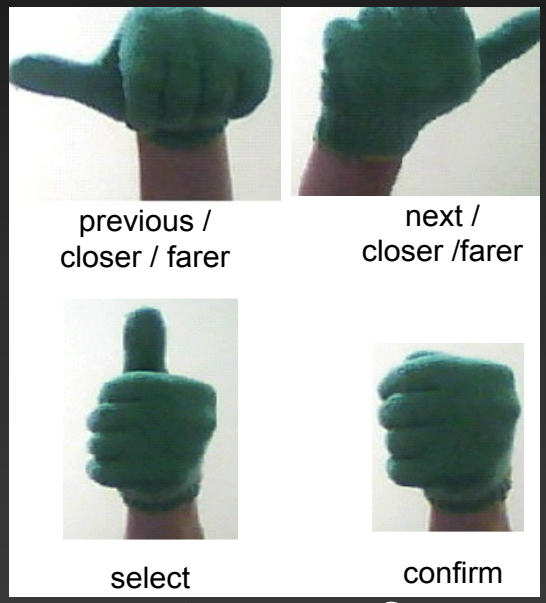
Abstract Behavior Model



Gesture-based Interface Navigation

Gesture-based Interface Navigation

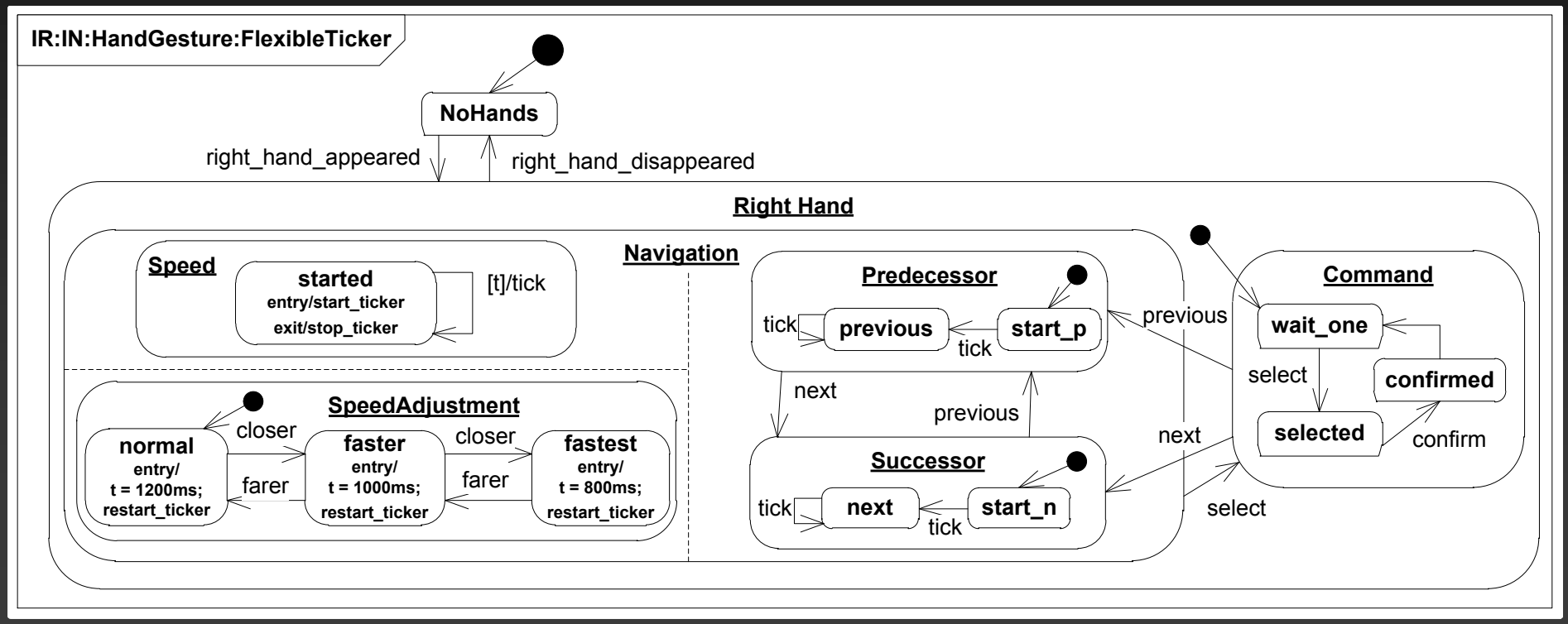




- Rapid model-based Design and Comparison of three variants

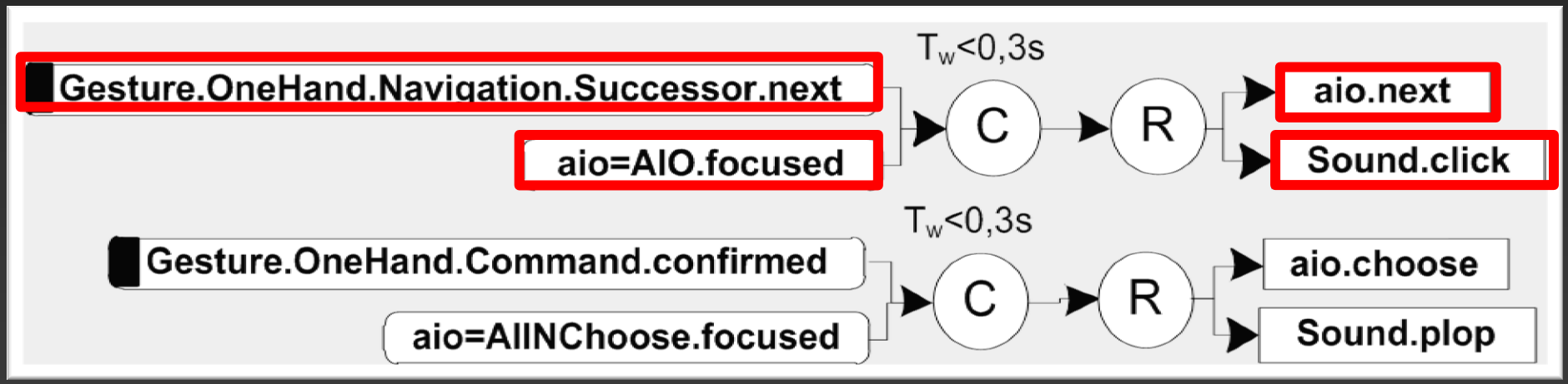
Published: HCII 2011, MoBe 2011, I-Com Journal

Mode Model
(Example: Gesture Interactor)



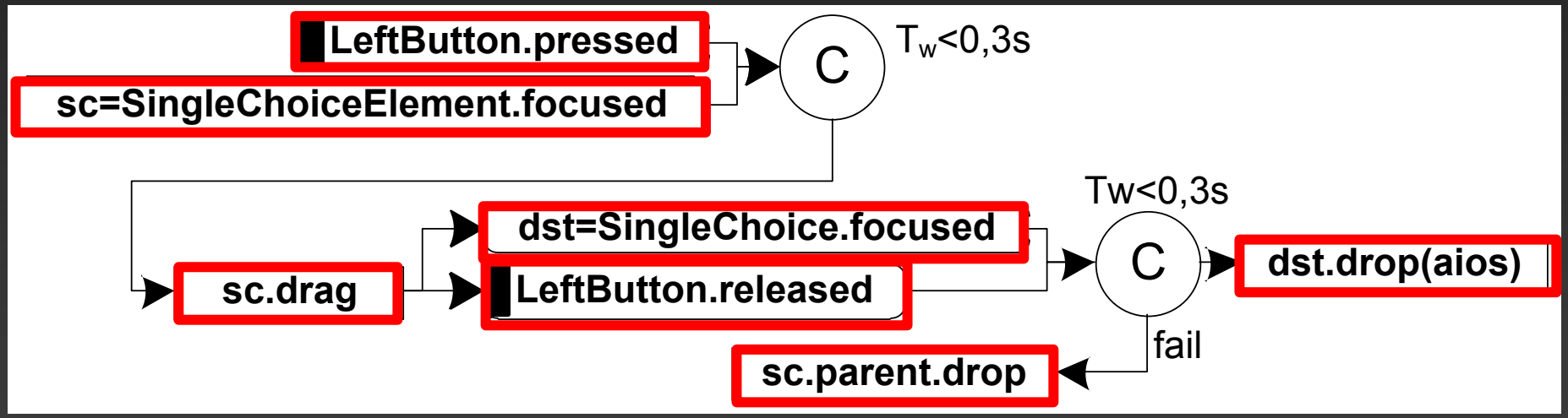
Multimodal Mapping

(Combining Mode with concrete Media)



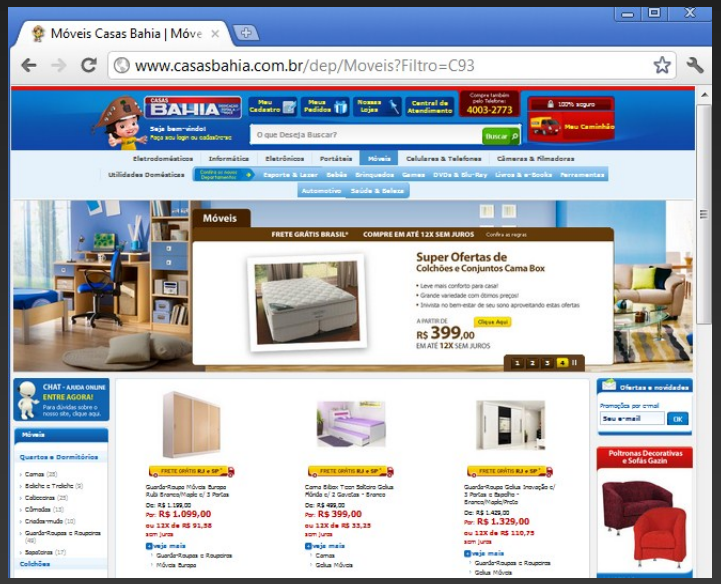
Multimodal Mapping

The Drag-and-Drop (abstract)



Further
Use Cases

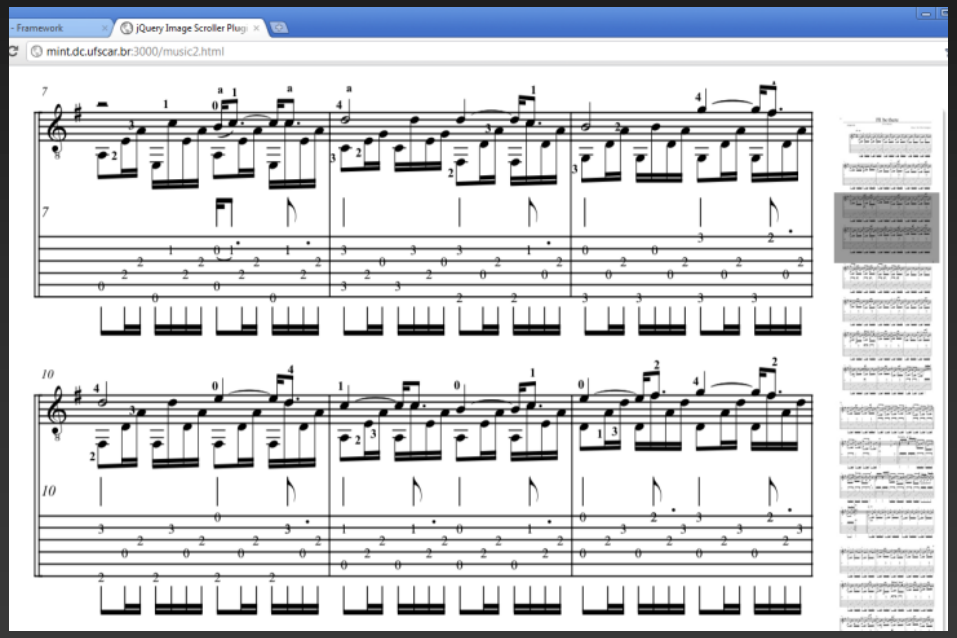
Augmented Drag and Drop

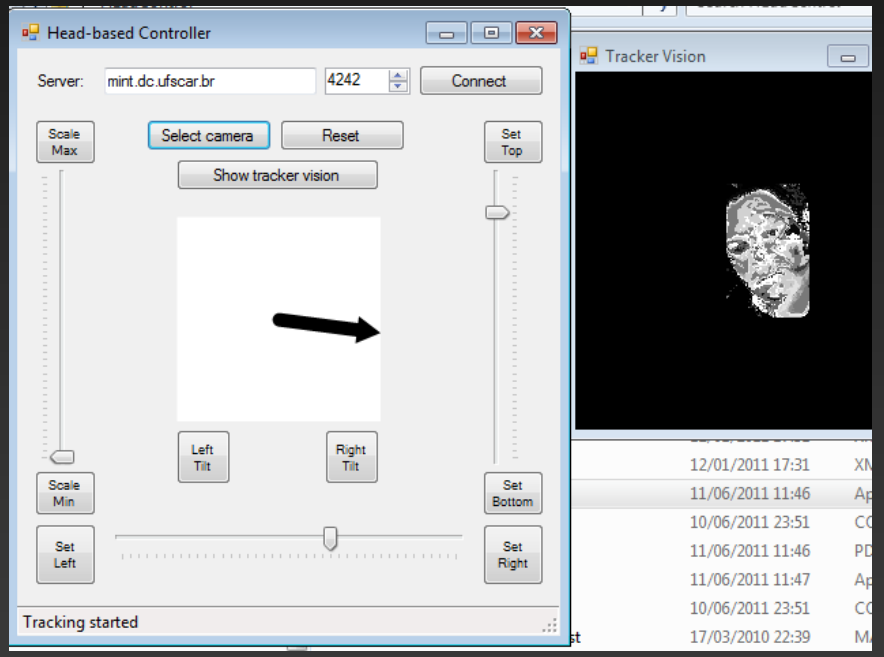


- Furniture Drag and Drop

  Published: SVR 2011

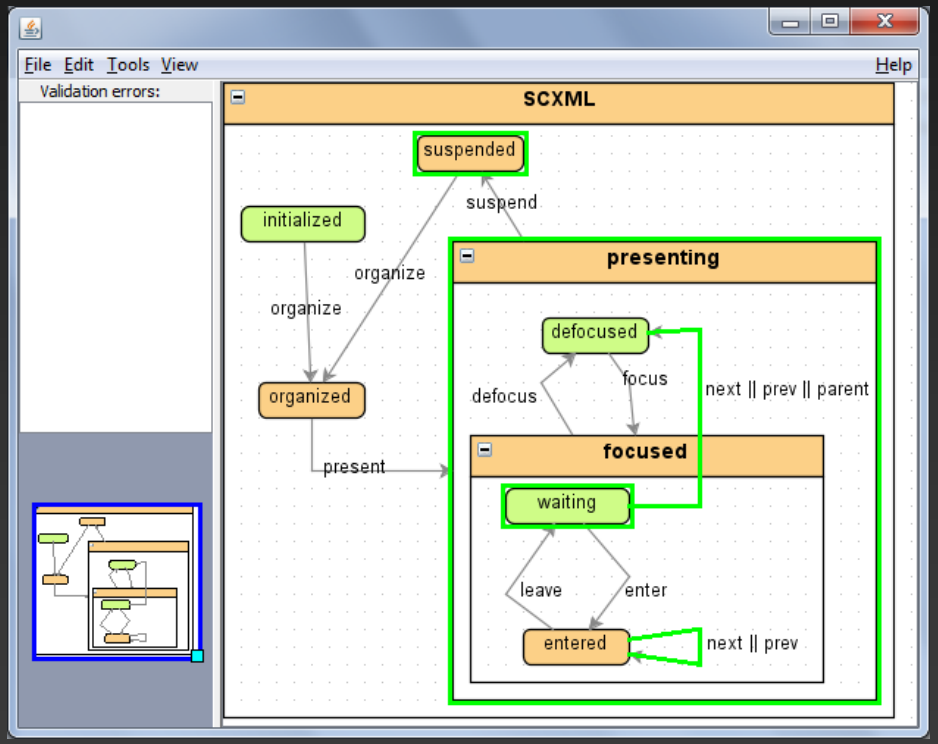
Head-based Interface Control





- Evaluation of controling a music sheet by using head movements

SCXML-based
Interactor Design



Two concepts

- Interactors
- Mappings

3 steps

1) Widget Design
2) Interacton Design
3) Mapping

What's there?

- Detailed Modeling of Multimodal Interactions (Media, Mode) including behavior
- Support for Paradigm Design via Mappings
- SCXML-based design and execution = No gap between Design- and Runtime
- Tools and Execution environment
  - (WebSockets, HTML 5 / CSS 3, Rails, NodeJS, Redis/TupleSpace, MMI-Arch)
- Machine-readable Specifications

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