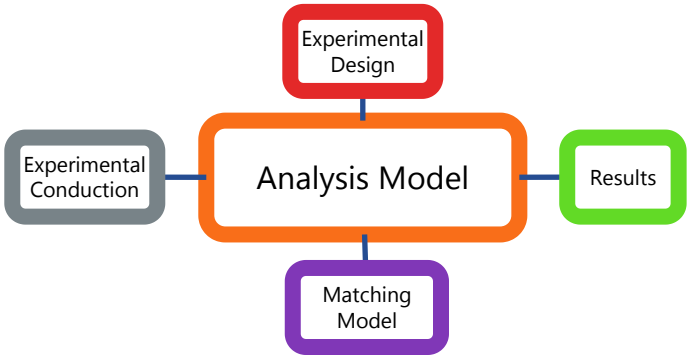


Universität Stuttgart

Method Choosing Decision Model for Eye Tracking

Tanja Blascheck, Michael Raschke, Thomas Ertl

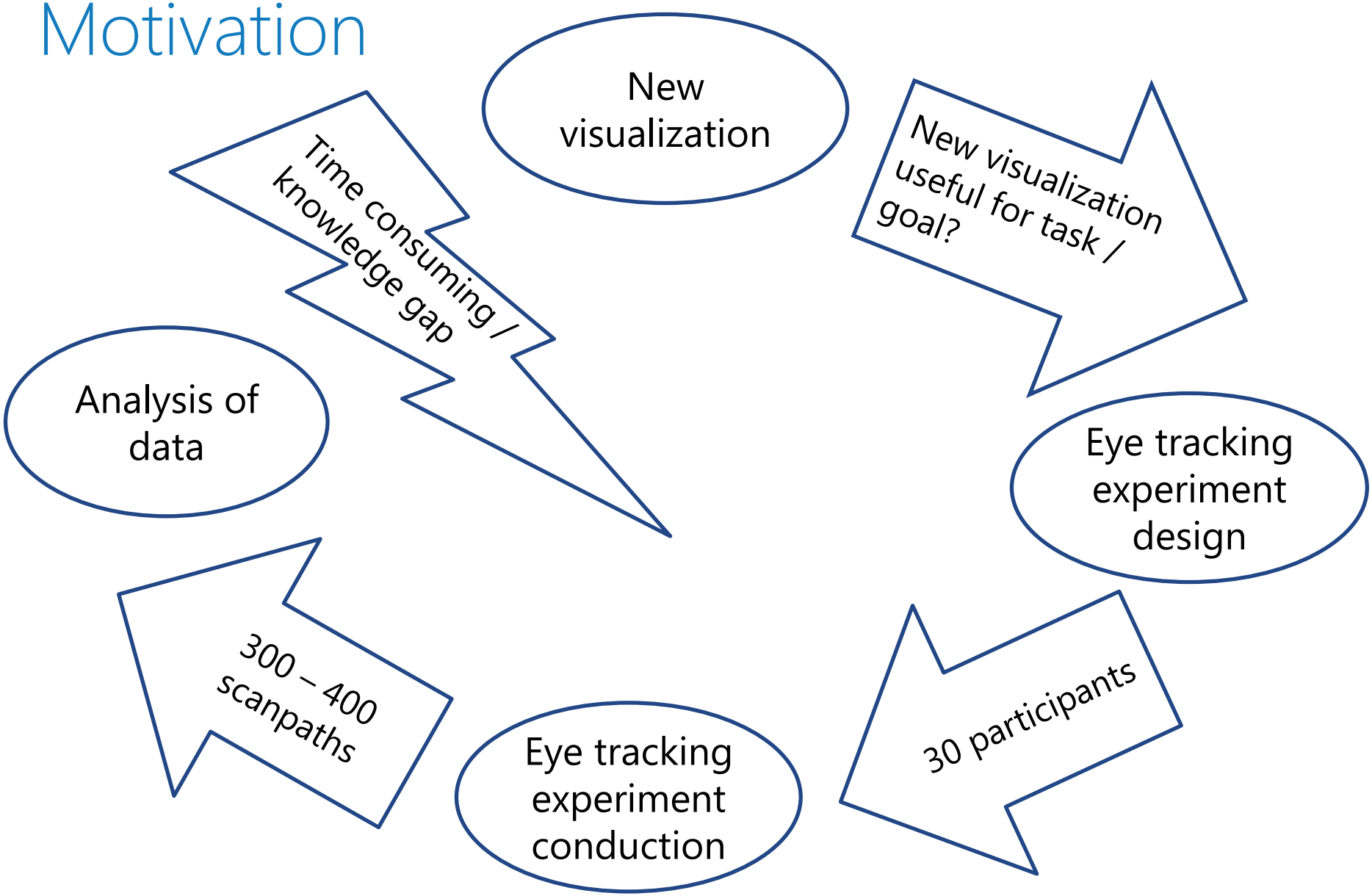
Eye Tracking: Why, When, and How | Dresden | 24.08.2013

Visualization and Interactive Systems Institute

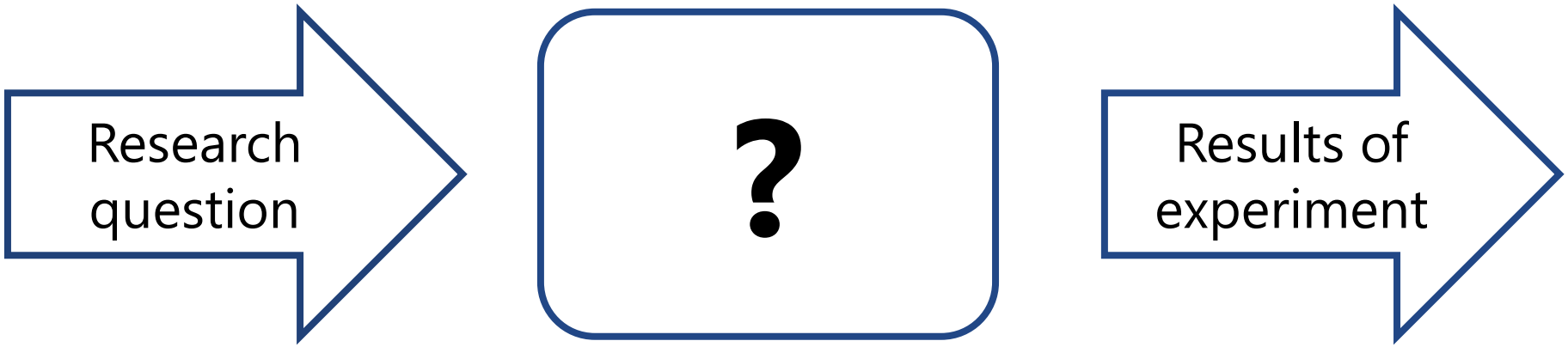
Content

- Motivation
- Method Choosing Decision Model
- Application Example
- Conclusion and Future Work

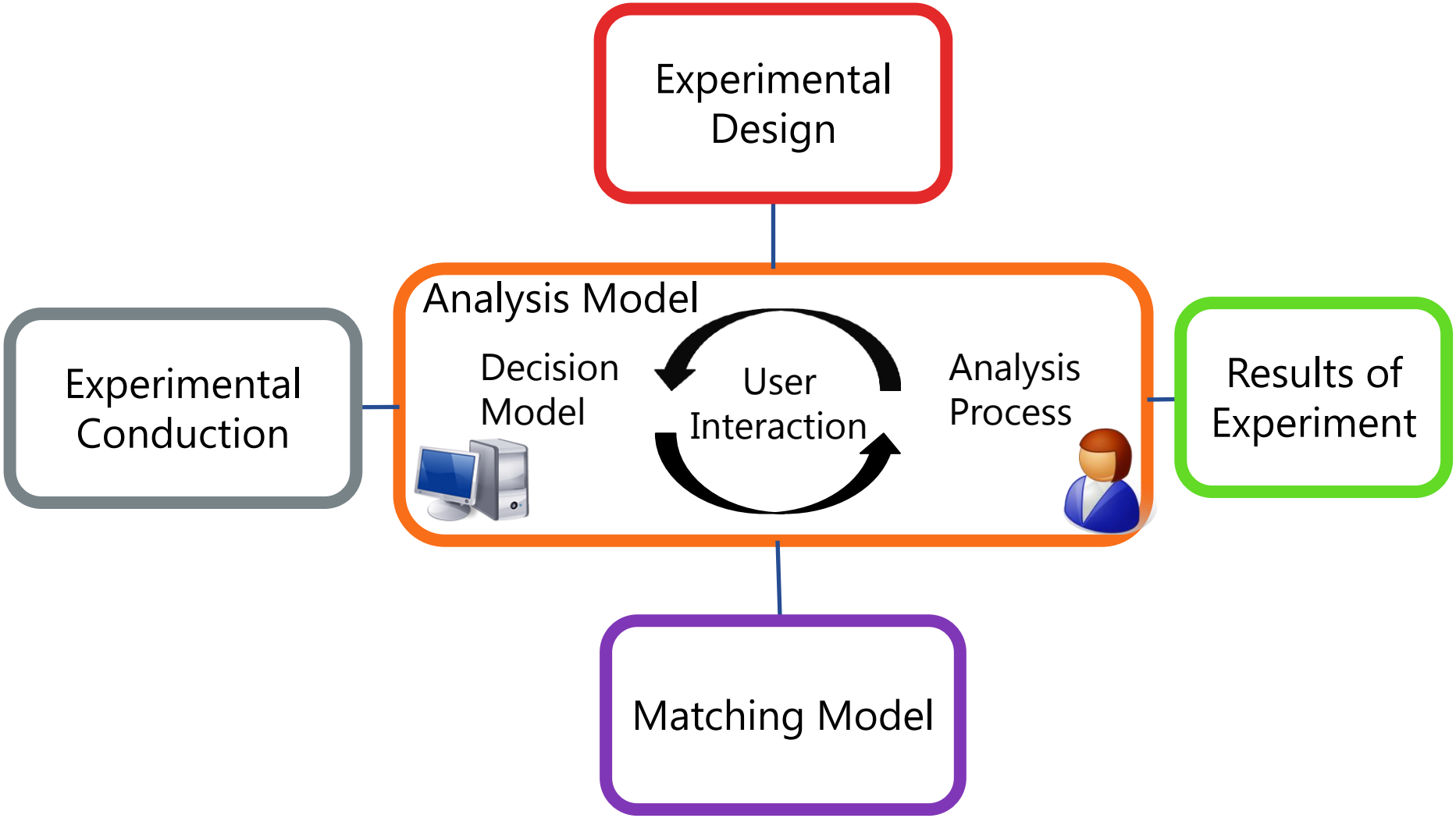
Motivation


New visualization
New visualization useful for task / goal?
Eye tracking experiment design
30 participants
Eye tracking experiment conduction
300 – 400 scanpaths
Analysis of data
Time consuming / knowledge gap

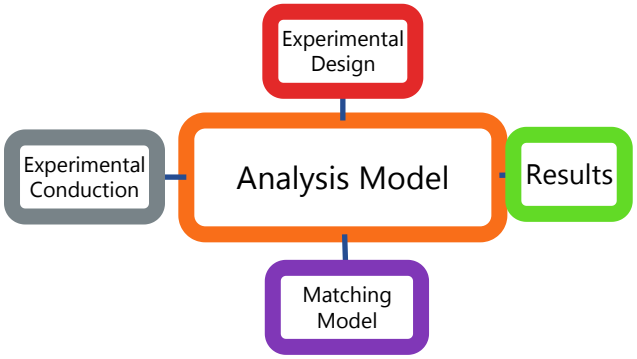
Motivation



Method Choosing Decision Model



Experimental Design



Visualization Technique

Experimental Design Method

Experimental Categorization

Variables

Research Question

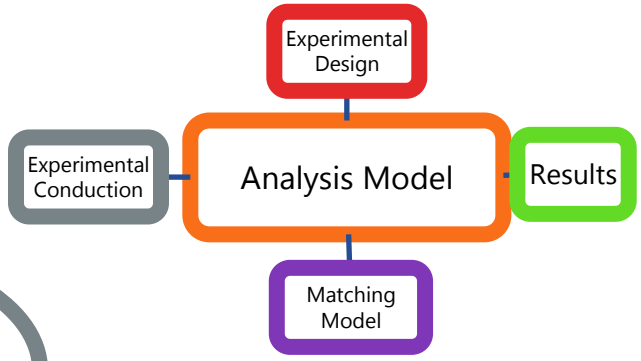
Data Collection Method

Tasks

Stimuli

Structured and machine readable format

Experimental Conduction



Eye Tracking Data

Participant Data

Interaction Data

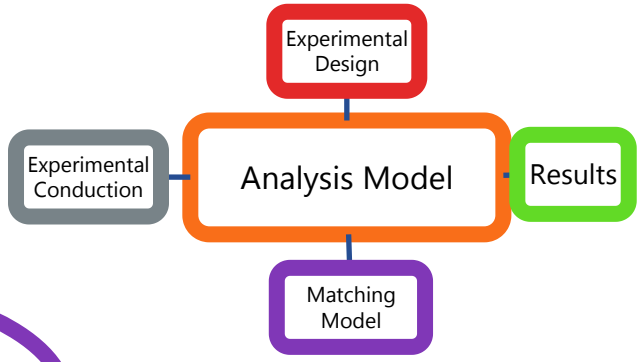
Collected Experimental Data

Other Data

Preformance Data

Automatic collection, machine readable format

Matching Model



Eye Tracking

Analysis Tasks

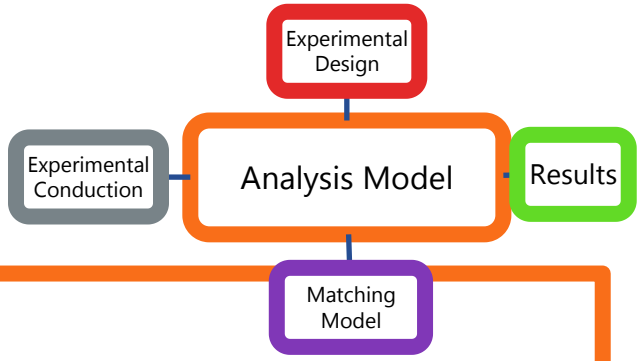
Visual Analysis Methods

Visualiz-ations

Visual Analytics

Andrienko et al. (2013)

Analysis Model



Rules / Guidelines

Feedback

Decision Model

User Interaction

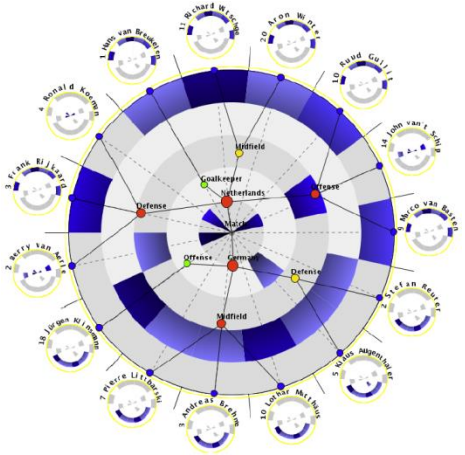
Analysis Process

Method Selection

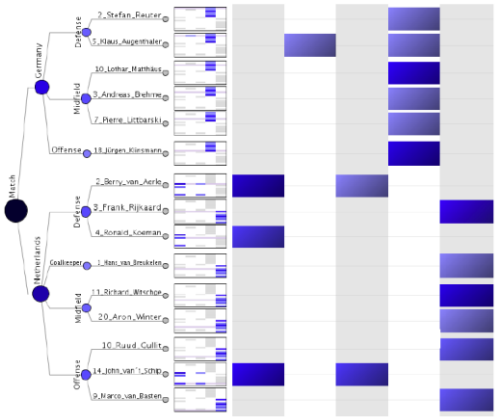
Analysis Concept

Application Example

- Basis: Experimental Design
  - Compare “Time Line Trees” with “Time Radar Trees”
  - Research Question: Why can TLTs better to answert questions than Time Radar Trees?



Time Radar Tree



Time Line Tree

Burch et al. (2008)

Application Example

1. DM: Suggest multiple analysis tasks
    1. Overall spatial pattern of eye movements
    2. Examine trajectories of participants

Application Example

1. DM: Suggest multiple analysis tasks
2. AP: Choose one analysis task
    1. Examine trajectories of participants

Application Example

1. DM: Suggest multiple analysis tasks
2. AP: Choose one analysis task
3. DM: Suggest multiple visual analysis methods
    1. Scan path
    2. Space time cube

Application Example

1. DM: Suggest multiple analysis tasks
2. AP: Choose one analysis task
3. DM: Suggest multiple visual analysis methods
4. AP: Choose on analysis method
    1. Scan path

Application Example

1. DM: Suggest multiple analysis tasks
2. AP: Choose one analysis task
3. DM: Suggest multiple visual analysis methods
4. AP: Choose on analysis method
5. DM: Create visual analysis method
    1. Scan path is created from input data

Application Example

1. DM: Suggest multiple analysis tasks
2. AP: Choose one analysis task
3. DM: Suggest multiple visual analysis methods
4. AP: Choose on analysis method
5. DM: Create visual analysis method
6. AP: Use visual analysis method
7. AP: go back to step 1 or 3

Conclusion and Future Work

- Method Choosing Decision Model for Eye Tracking Data
  - Experimental Design
  - Experimental Conduction
  - Matching Model
  - Analysis Model: Decision Model + Analysis Process

- Future Work:
  - Define appropriate analysis tasks
  - Define and create visual analysis methods
  - Define the matching model
  - Define rules and guidelines for the decision model
  - Conduct case studies to test the model