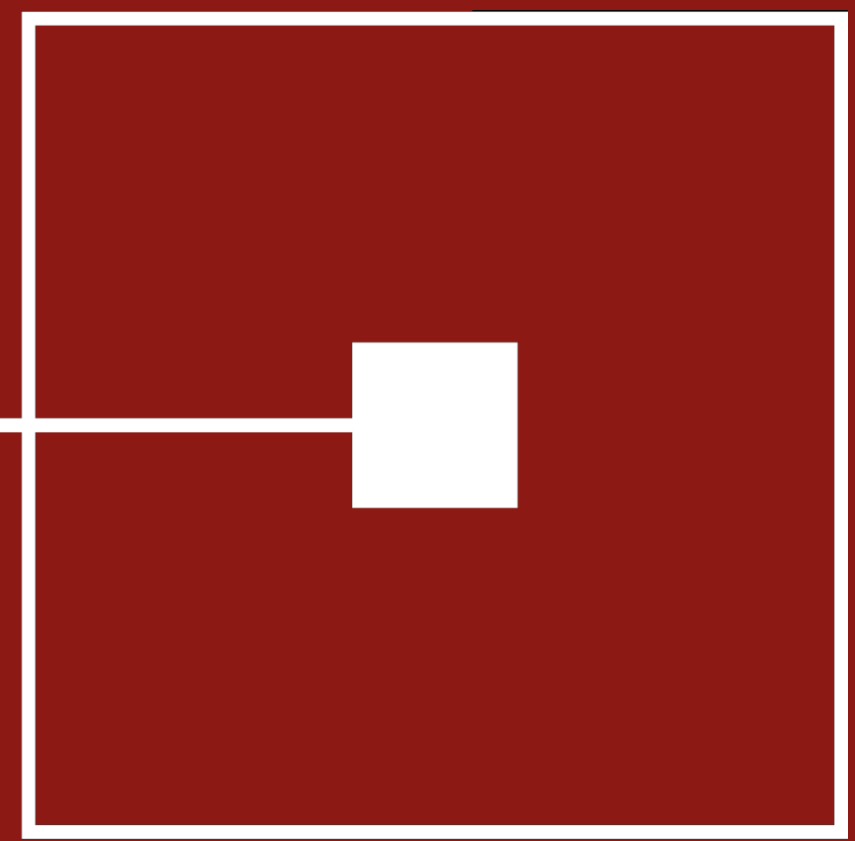


Test Automation for Multi-touch User Interfaces of Industrial Applications

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SCCH

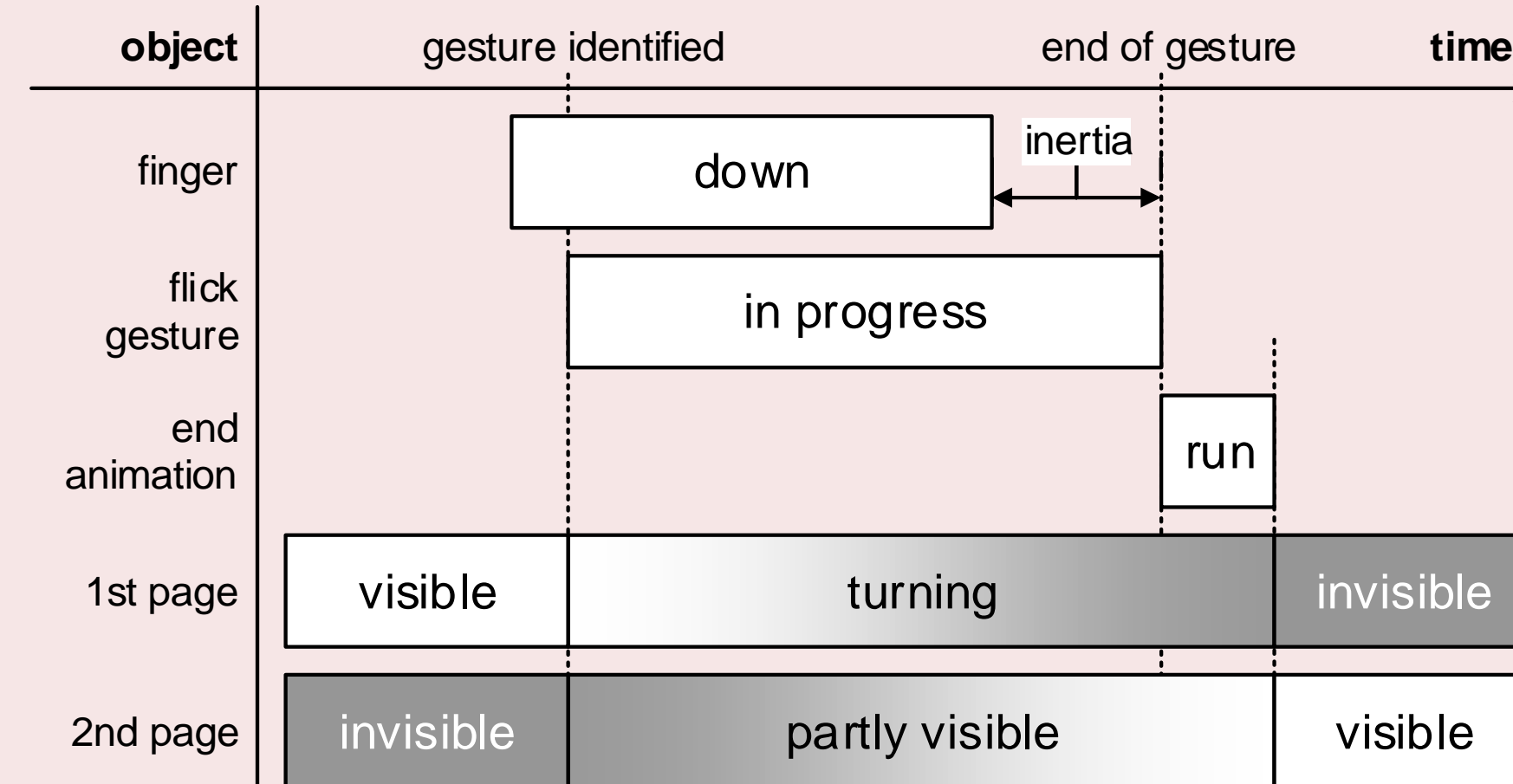
software competence center
hagenberg



Challenges in Multi-Touch-UI Testing

Complexity

- A gesture spans a period of time
- Multiple states

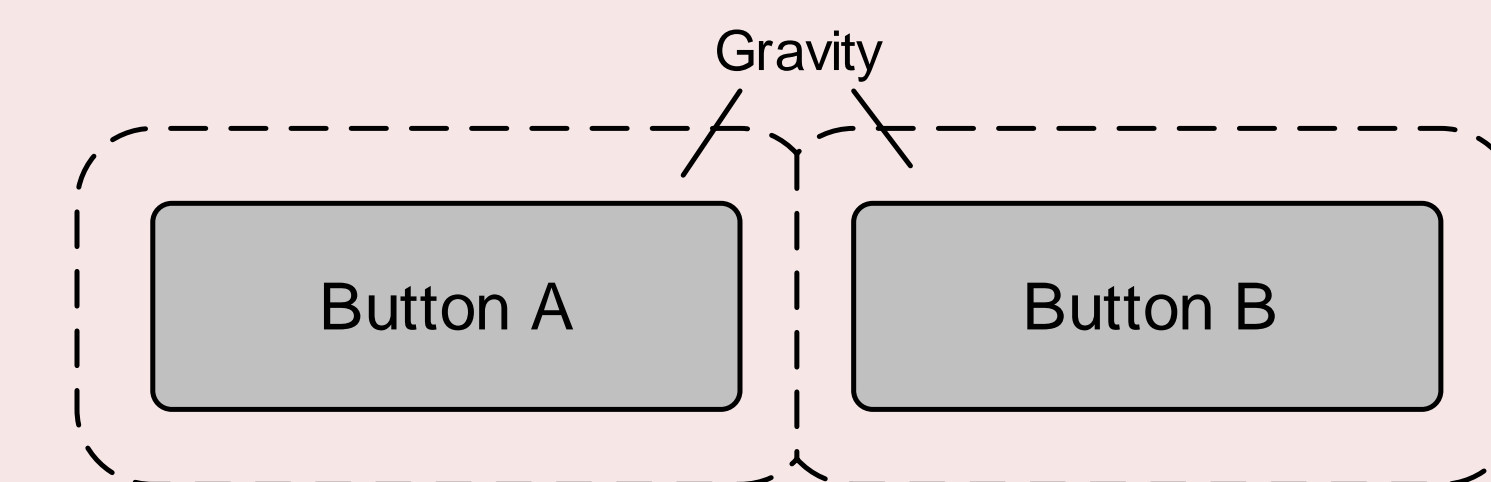


Diversity

- Characteristics of a performed gesture are very individual
- Gestures are more vulnerable to disabilities than traditional user input

Fuzziness

- Touch-interactions are less precise than mouse input
- "Gravity" is a common technique to expand the touch-sensitive area beyond the actual bounds of a control



User Input

Capture

Replay

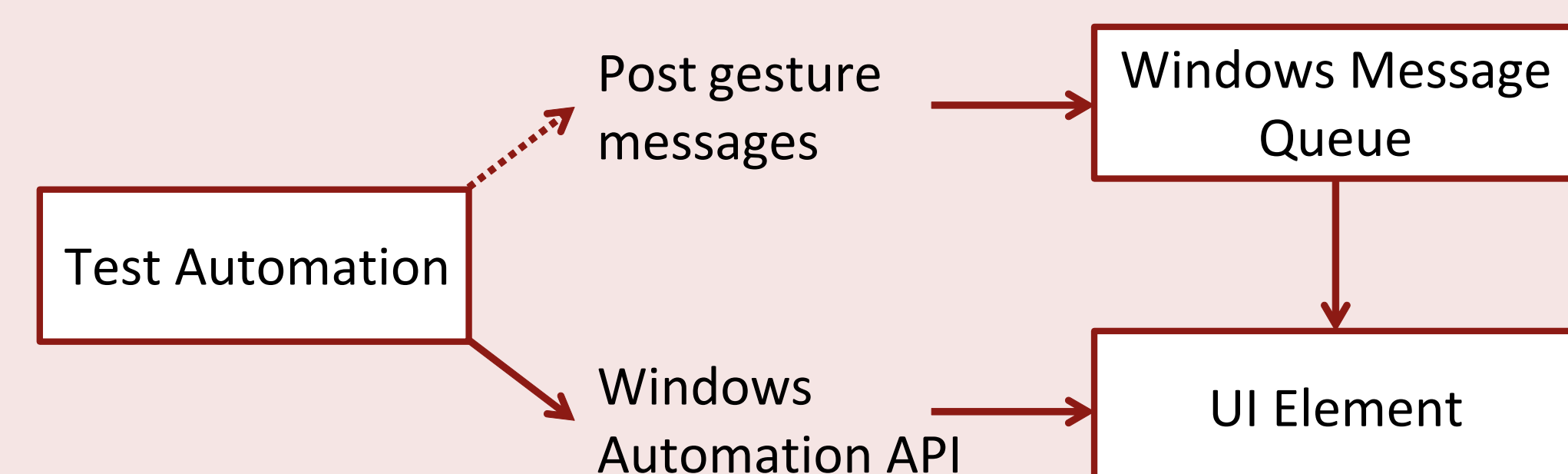
Low level touch events

Gesture Recognition

Approach and Implementation

Preconditions

- Windows 7 Embedded: missing tool support for test automation
- Keep impact on existing code as low as possible



Gesture events

Application features

Parameter	Physical characteristics
Timestamp	speed of finger movements
Height and width of Bounds	contact pressure of finger
Left, Top of Bounds, Position	jitter of finger movements
Relative position of touch points to each other	size of the hand, one-hand vs. two-hand gesture (rough estimation)
Interchange of up- and downstream events	jitter (different movement speed) of finger movements
Insertion of TouchUp and TouchDown events	jitter (brief lifting of fingers) of finger movements