Steering via the Image in Local, Distributed and Collaborative Settings

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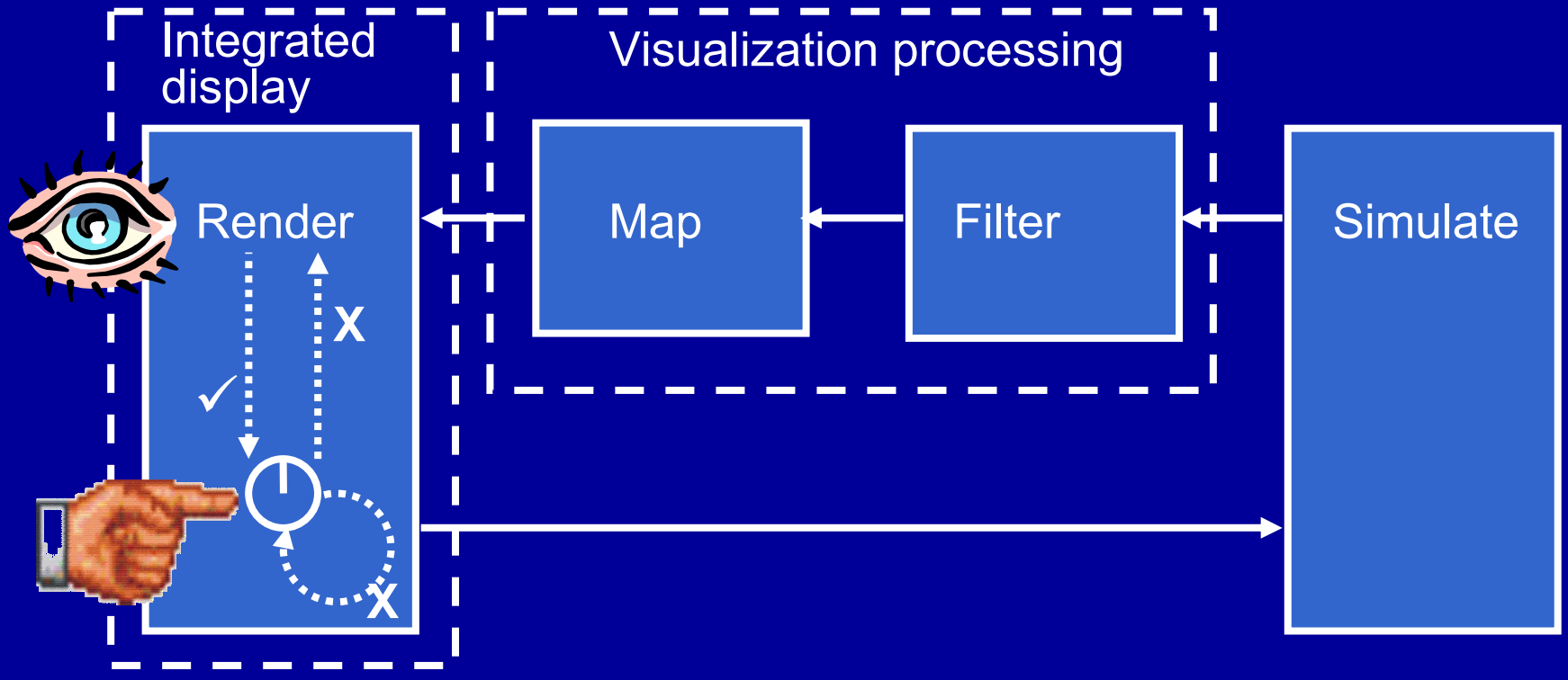
Road Map

- Prior work
- Modelling states and transitions
- Putting it into practice
- Demonstration
- User study results
- Discussion

Contributing Technologies

- gViz steering library, previously used along with COVISA tools, to steer a remote simulation collaboratively
- Multi-purpose image interaction (MPII), previously used to steer a local simulation individually, but statelessly
- A ‘visualization-first’ architecture incorporating ‘statefulness’:

‘Stateful’ Steering



Single-User State Model

Sim state	Fn	Initially	During manip	On release
Initial	Free	Consistent	Consstnt	Consstnt
Paused	Free	Consistent	!Consstnt	!Consstnt
Running	Free→ locked	Consistent	!Consstnt	!Active (!Consstnt)

Collaborative State Model (1)

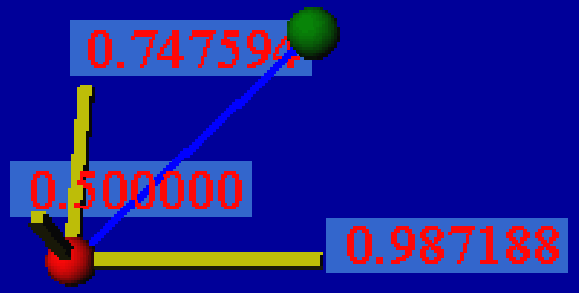
	Fn	Initially	During manip	On release	On com-mittal
I	Free→ locked	Consstnt	Consstnt	Consstnt	!Active
P	Free→ locked	Consstnt	!Consstnt	!Consstnt	!Active
R	Free→ locked	Consstnt	!Consstnt	!Consstnt	!Active

Collaborative State Model (2)

	Initially	During manip and on release	On committal
I	Consistent	Consistent	!Active
P/R	Consistent	!Consistent	!Active

‘Stateful’ MPII (MPII+)

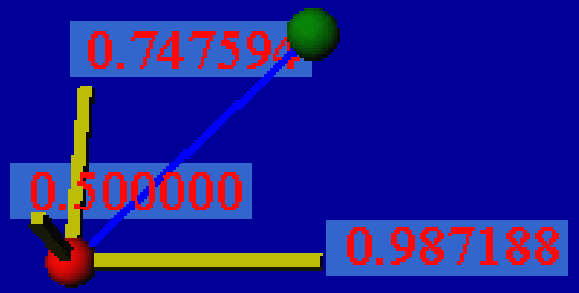
I



I - movable

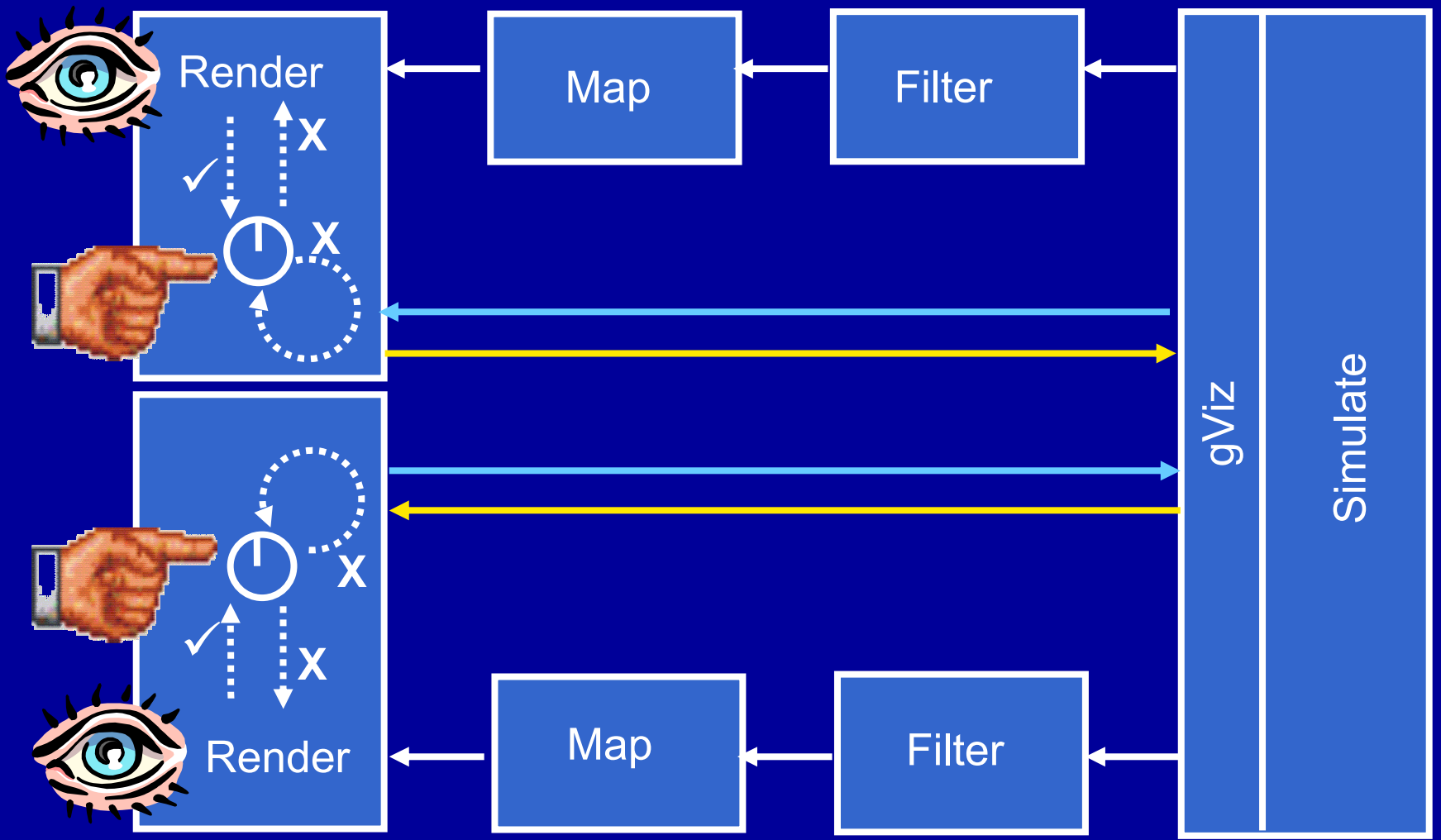
M-R - movable

C - fixed



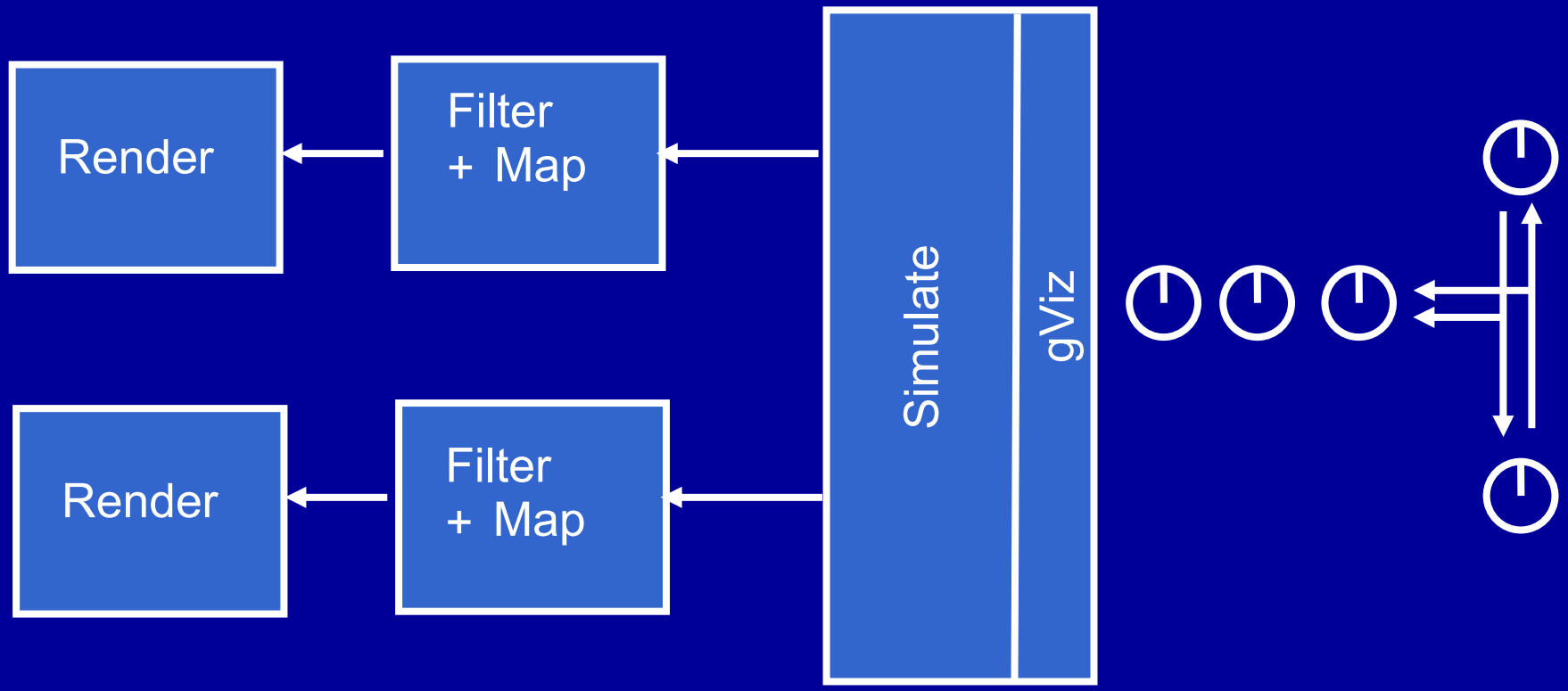
P/R

MPII+ with Modified gViz

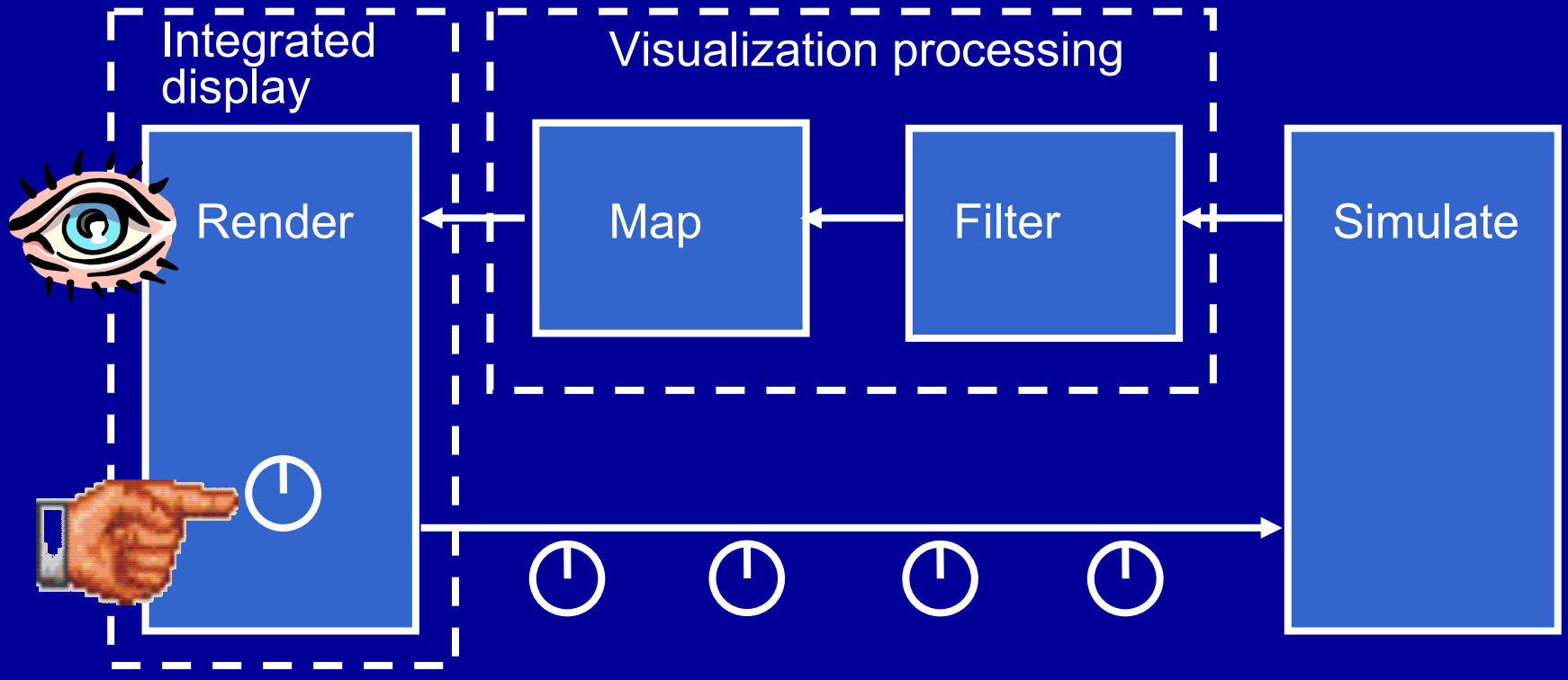


Demonstration

cf gViz + COVISA



cf ‘Stateless’ MPII

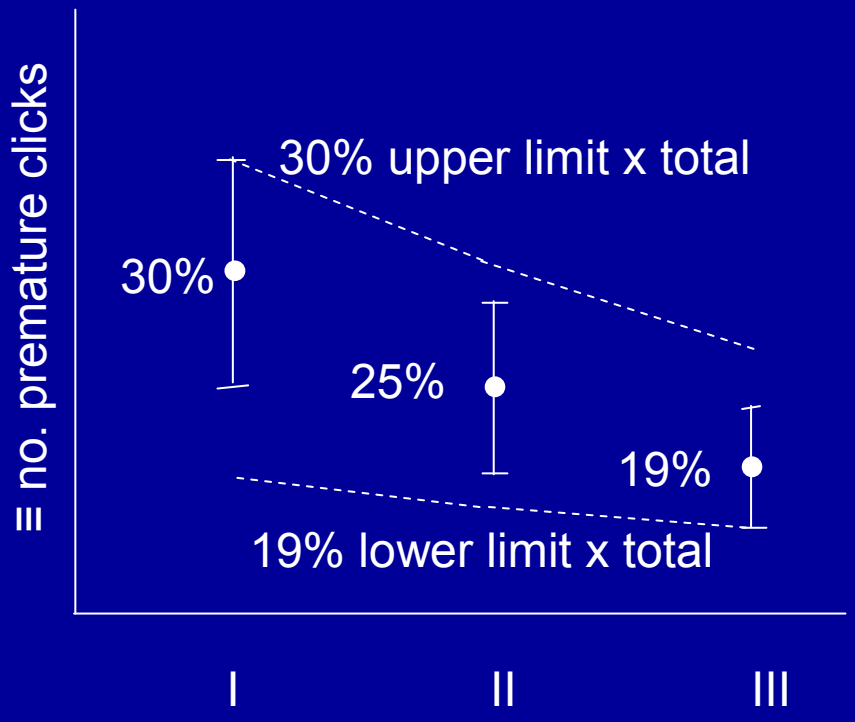


‘Stateful’ Collaborative Steering - Benefits

- Maintain graphical context of interaction
- Maintain *visibility* of current values amongst collaborators
- Maintain *consistency* of current values with the simulation

Visual Cues - User Study

- 2 (pilot) + 6 (figure, right) users
- Steered smoke into particular corner
- With
  - (I) no feedback
  - (II) red+green feedback
  - (III) red+green feedback plus prior explanation



Discussion (1)

- What about remote sim *and* vis?
  - (?) composite large-data remote vis with locally rendered interactor (?)
  - Have standard parameter widgets but within stateful architecture
- Handling multiple parameters
  - Individual committal *versus*
  - Sending *all* changed parameters each time any one is committed

Discussion (2)

- Considering large-scale user study
  - Use HCI students!
  - Fully automated interaction logging
  - Fully randomised with between- and within-group analysis
  - Will remove background effects due to learning

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