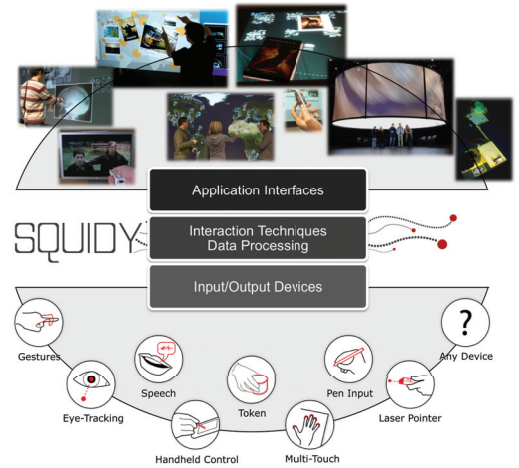# Squidy - Interaction Library
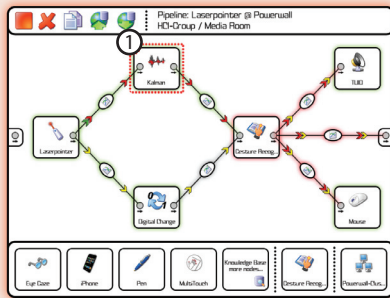## A Zoomable Design Environment for Natural User Interfaces

SQUIDY

Squidy is an interaction library which eases the design of natural user interfaces (also known as "post-WIMP interfaces") by unifying various device drivers, frameworks and tracking toolkits in a common library and providing a central and easy-to-use visual design environment. Squidy offers diverse input modalities such as multi-touch input, pen interaction, speech recognition, laser pointer-, eye- and gesture-tracking. The visual user interface hides the complexity of the technical implementation from the user by providing a simple visual language based on high-level visual data flow programming combined with zoomable user interface concepts. Furthermore, Squidy offers a collection of ready-to-use devices, signal processing filters and interaction techniques. The trade-off between functionality and simplicity of the user interface is especially addressed by utilizing the concept of semantic zooming which enables dynamic access to more advanced functionality on demand. Thus, developers as well as interaction designers are able to adjust the complexity of the Squidy user interface to their current need and knowledge.
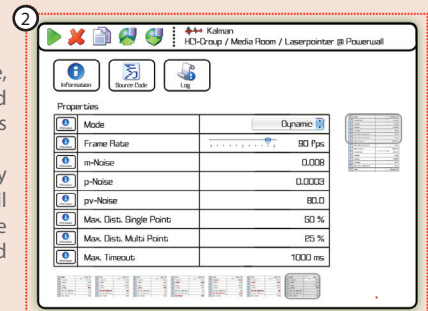
User Interface

Pipe-and-filter
Users with less or no programming skills are supplied by a simple visual language which is based on the pipe-and-filter metaphor. Data flows from input nodes (e.g. laser pointer) through signal processing filters (e.g. Kalman filter ①) to output nodes (e.g. display cursor).

Semantic zooming
When zooming into a node, additional information and corresponding functionalities appear (compare ① and ②). Thus, the user is able to gradually define the level of detail (complexity) according to the current need for information and functionality.

Key Aspects

Multi-threading
The possibility for multiple in and out connections provides a high flexibility and the potential for massive parallel execution of concurrent nodes. Each node generates its own thread and processes its data independently as soon as it arrives. This effectively reduces the processing delay that could have a negative effect on the interaction performance.

Reusability & comparability
Nodes are completely independent components, offer high reuse, are free from side effects, and can be activated separately e.g. for comparative evaluations.

Dataflow visualization
The visual inspection of the current dataflow helps to identify possible issues and facilitates fast error correction at runtime.
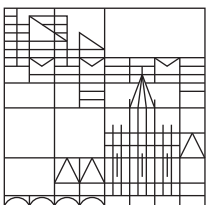
Less demanding
Semantic zooming enables users to adjust the complexity of the user interface to their current need. Moreover, users may use filters and devices as "black boxes" without any knowledge of the technical details and thus concentrate on the design.

Interactive configuration
Changes in the dataflow and configuration of node parameters are instantly applied and thereby can change the interaction. This supports fast and interactive design iterations.

Visual interaction design
The pipe-and-filter concept augmented with semantic zooming offers a very simple, but powerful visual language for the design and development of natural user interfaces.

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