

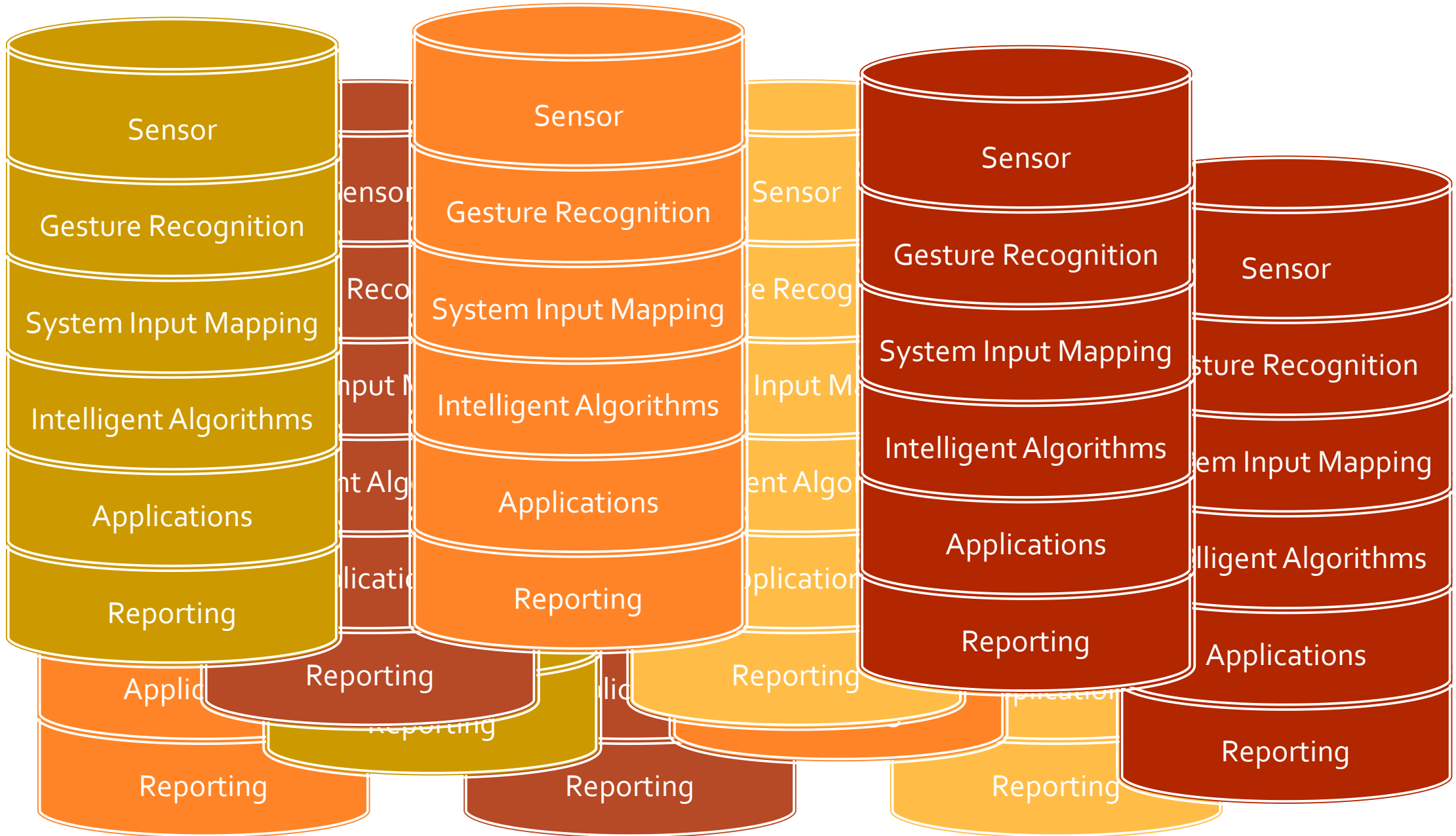
THE INPUT MODALITY PROBLEM

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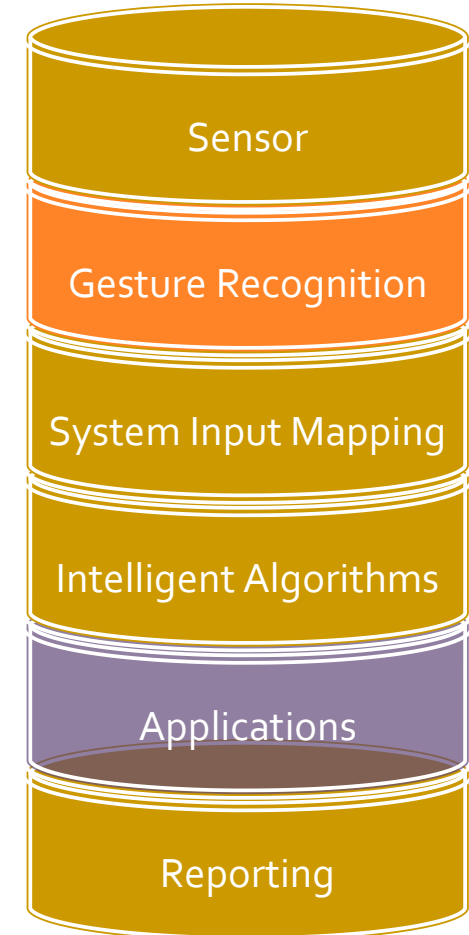
Finding the Problem

- Initial Research Focus
 - Enabling rehabilitative motions to be used as computer input
- Hundreds of Research Projects
 - Motion Recognition
 - Game(s)
 - Reporting
- Thousands of variations of input modalities
- Each Project “starts from scratch”
- Validation and Reproduction Problems



Platform for Transforming Input

- Remove redundant development of “modules”
 - Development effort
 - Consistency
 - Flexibility
 - *Transform*



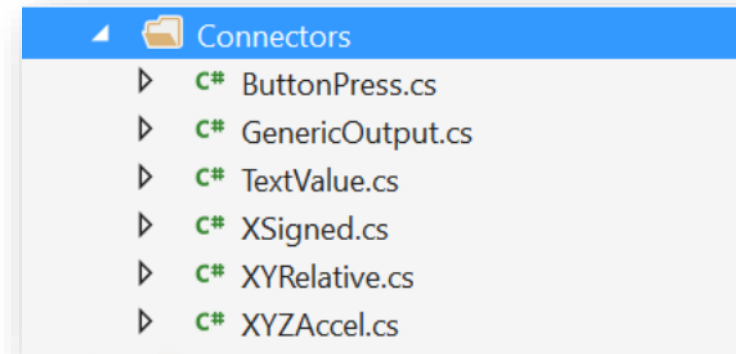
Aggregated Input Modality Engine

- AIME...
 - Tool to map different modules together
 - Flexible/Extensible data types
- 3 Main Layers/Module (Conceptual Categories)
 - Input
 - Processing
 - Output



Input

- Sensors!
- Gather external data
- Attached or external source
- Use existing data types
 - Button Press
 - 1d,2d,3d Vectors
 - Text
- ...or define new data types



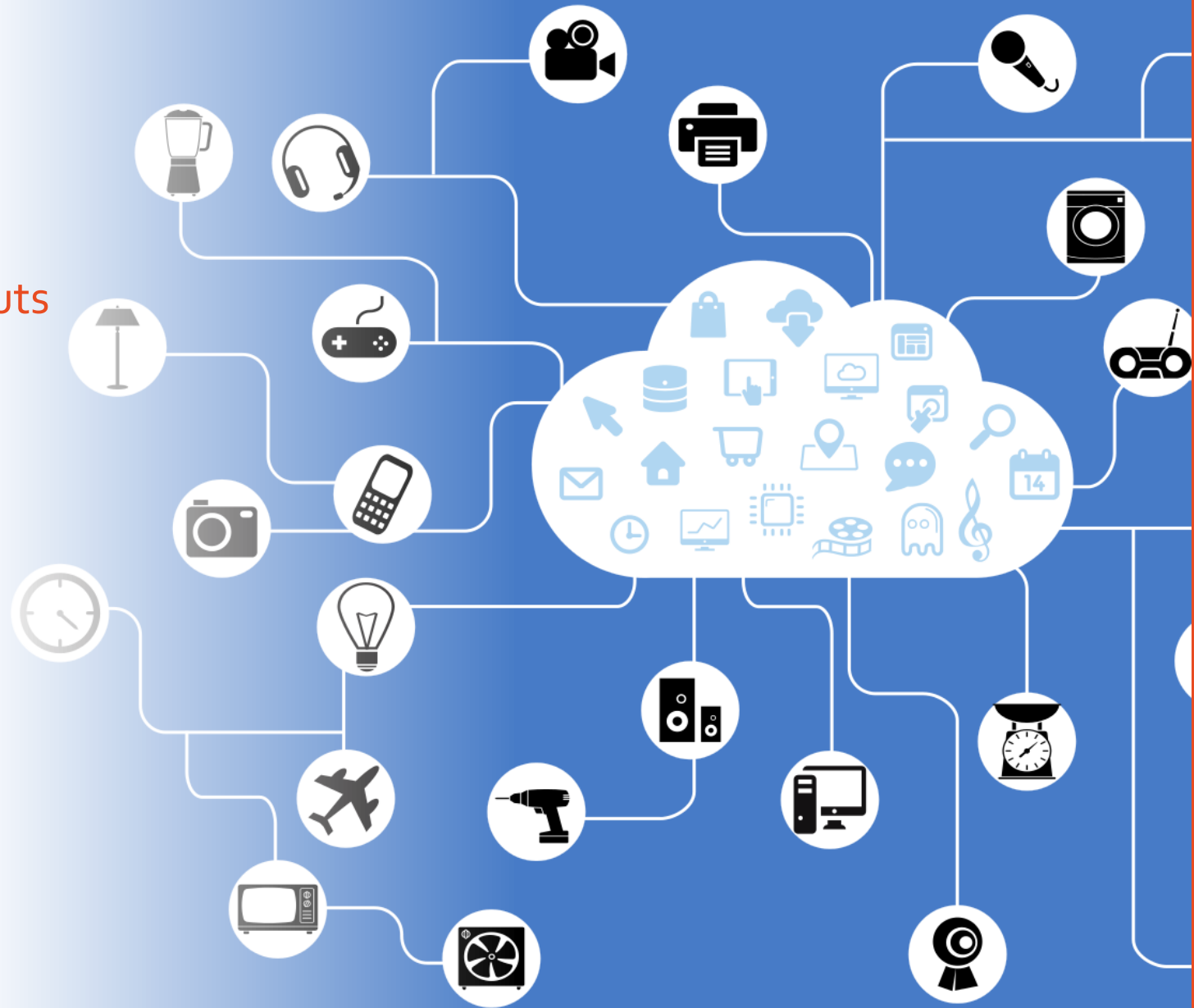
Processing

- Gestures
- Range
- Learning systems (AI)
- Conditional switching



Output

- Emulate system's standard inputs
 - Keyboard/Mouse
- Report
 - Network
 - Files



Project Status

- C# Engine
 - External Modules
 - Graphs are hard coded
 - Several modules of each type, except conditional
 - Allows piping of typed data across modules
- Working “graphs” for leg lifts, coin flips, accelerometer mouse control
- Would like to have:
 - UI for designing and manipulating graphs
 - Module browser/repository

Review: What Does it Do?

- Allows developers to implement smaller components and re-use other's work, more easily
 1. Focus on new gesture recognition technique
 - Use existing sensor modules
 - Applications
 2. Focus on new exer-game?
 - Can use existing modules..
 - Sensors
 - Gesture recognition
 - Output (game input)

Research

- I plan to study the effects on users having additional computer control.
 - Can we increase the incidence of beneficial activities?
 - Does allowing the user to specify what actions their physical based gestures apply to the computer impact the frequency of these activities?
- Study: Beneficial physical activity in office environment
 - 3 Groups
 - Just ask them to do leg lifts (control)
 - Leg lifts perform fixed action, (ALT-TAB)
 - Leg lifts perform customizable discrete action



THANK YOU

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