

Exploring Sensors & Actuators for Immersive Learning Scenarios

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Exploring Sensors & Actuators for Immersive Learning Scenarios



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Immersive Learning: characteristics & motives

Solving problems through **Authentic Tasks**

Active and interactive participation

Develop conceptual understanding (practicing: models-simulations)

Ability to perform scientific inquiry

Develop understanding about inquiry (reflection + natural feedback)

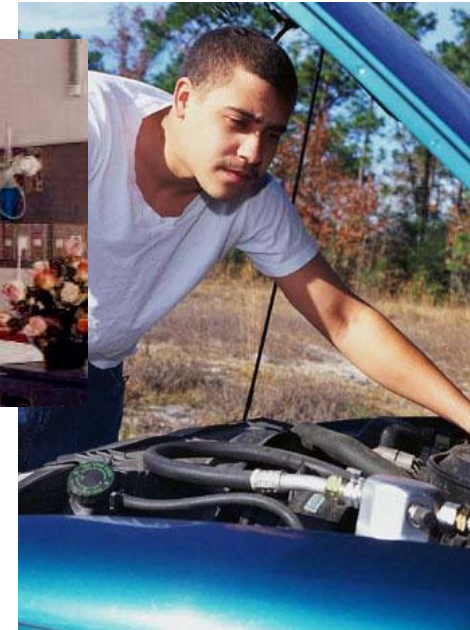
Experiencing emotions and reasoning in authentic environments

All about: Authenticity - suspension of disbelief - motivation



Authentic Tasks

= **realistic** problem situations, where learners participate as **actor** and constantly are being confronted with the **consequences** of their actions when **applying** knowledge and skills in finding solutions



Authentic tasks - characteristics

(Herrington, Oliver, Reeves, 2002)

- real-world relevance
- ill-defined (learners define subtasks themselves)
- complex tasks (time consuming)
- different perspectives (variety of resources)
- opportunity to collaborate
- opportunity to reflect
- integrated & different subject areas, beyond domain-specific outcomes
- real-world assessment
- competing solutions, diversity of outcomes
- polished products



Sensors & Actuators

Affordances of Sensors

- ***Continuous non-disruptive data gathering of user (behavior, biodata)***
- **Continuous data gathering of environment of user**



Affordances of Actuators

- **Can influence environment**

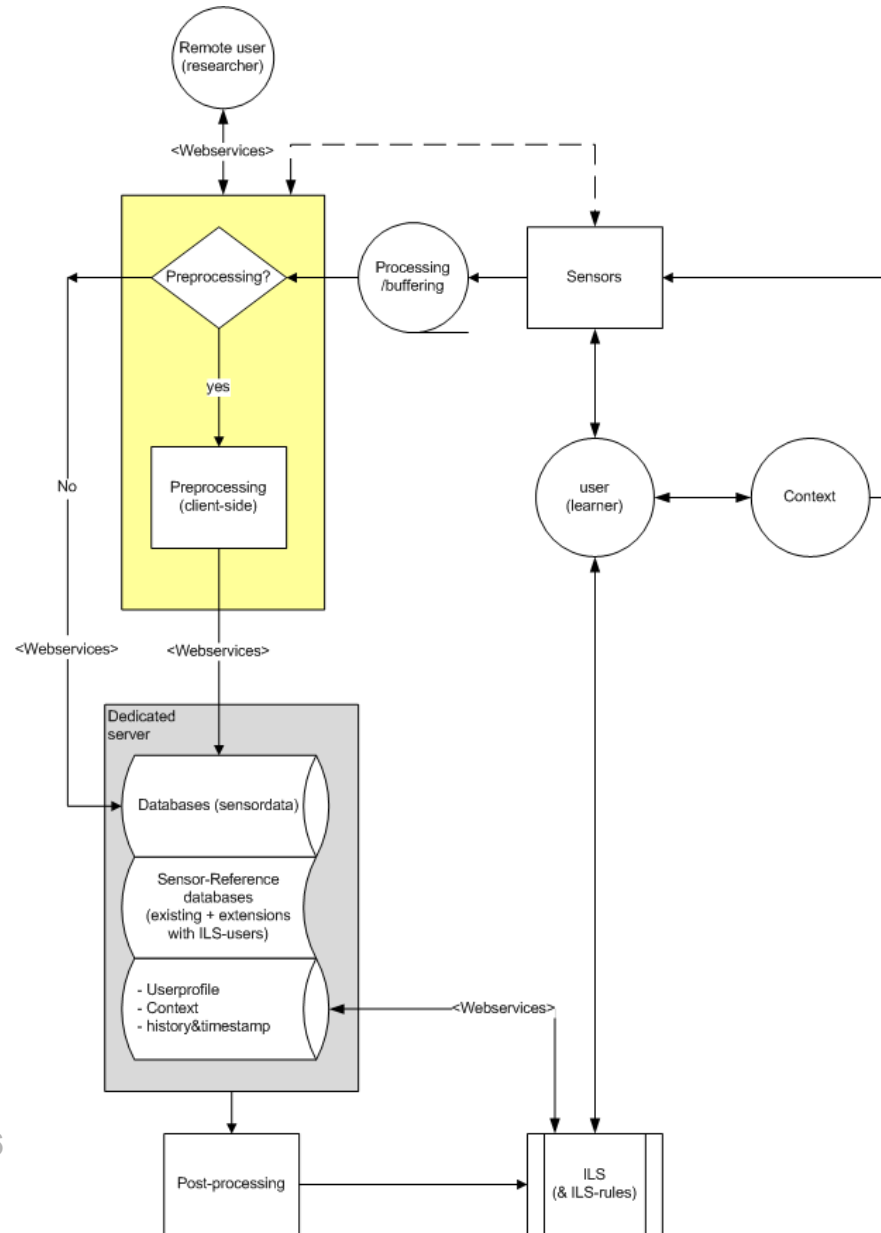


Goals

- **Enhance learner support**
- **Sustain 'Flow'**



Draft framework Sensors & Actuators



Categories of Sensors

- *Physiological sensors irt biodata (heartbeat, EEG, skin resistance)*
- *Physiological sensors irt affection detection (face & voice emotion)*
- *Motion sensors (physical movement, eye-tracker)*
- *Orientation sensors (physical orientation)*
- *Location sensors (geographic location)*
- **Scanning sensors (barcode, RFID)**
- **Electrical sensors (electrical systems)**
- **Environmental sensors (surroundings, weather a.s.o.)**
- **Light sensors (light characteristics)**
- **Mechanical sensors (mechanical devices, instruments)**
-

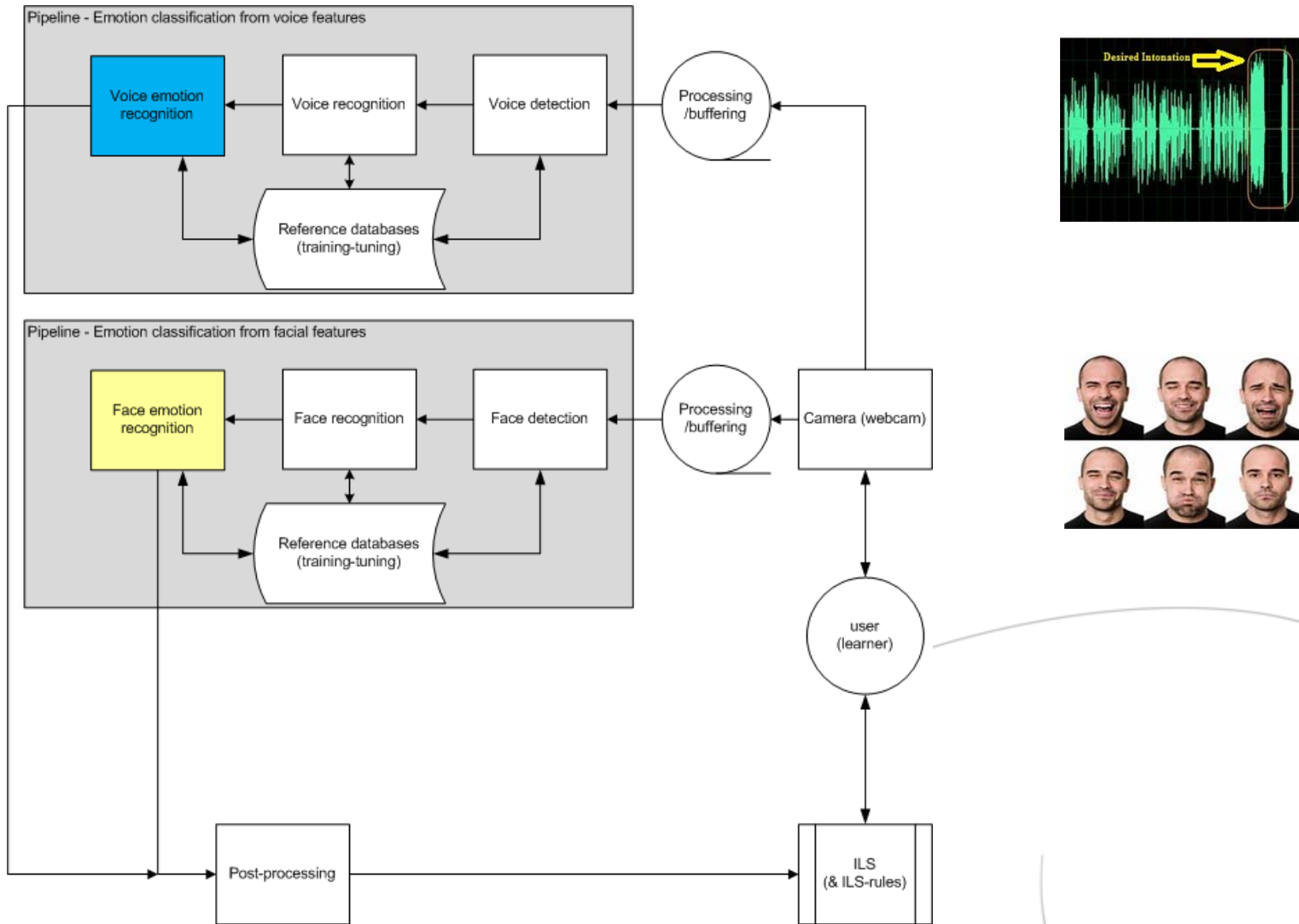


Tasks - ongoing

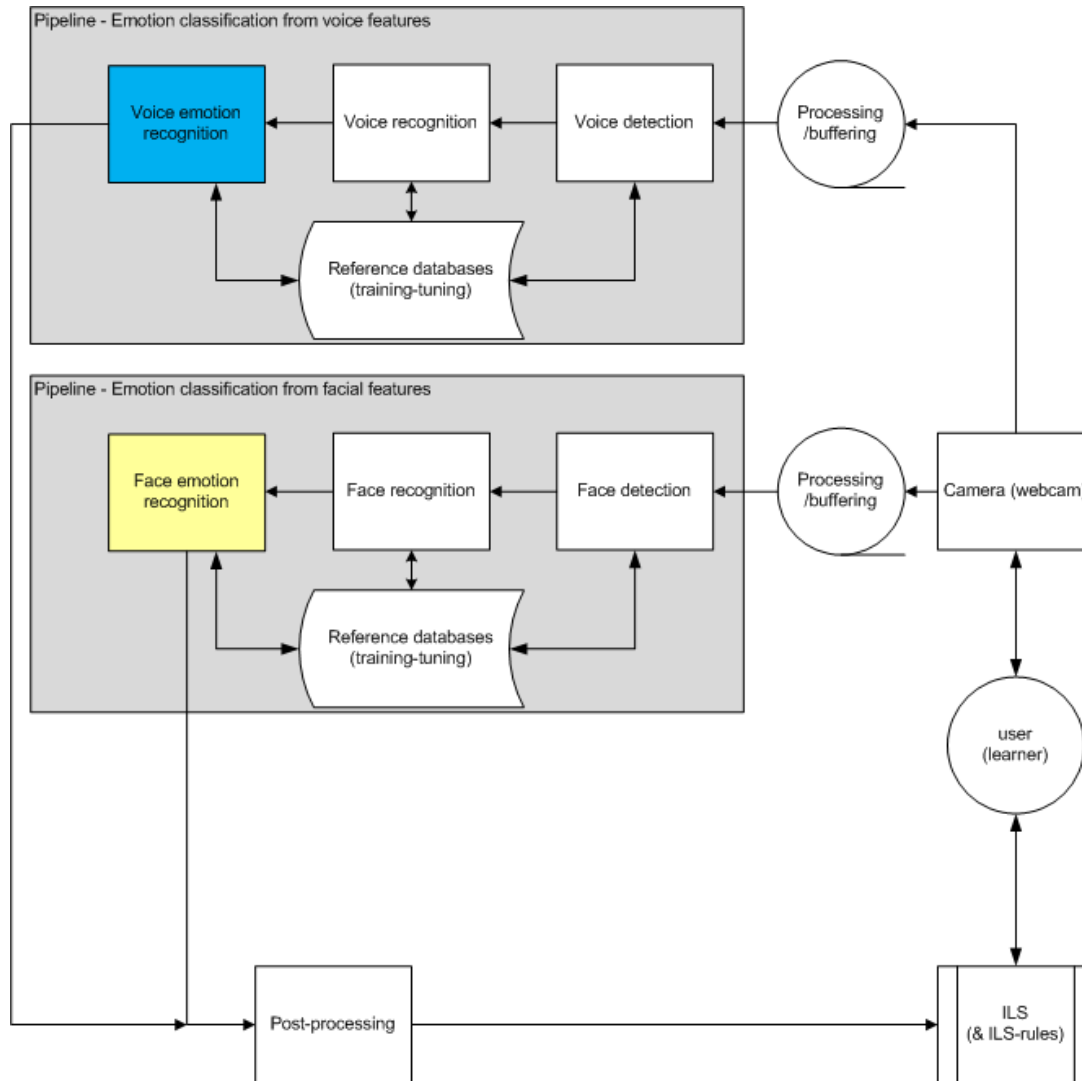
- Define conceptual & technical framework
- Technical setup software and equipment
- Demonstrator (sensor room)
- Refine conceptual & technical framework
- Define pilots (link with PhD proposal(s))
- Scouting for additional equipment and software
-



Pipelines – face & voice emotion recognition



Pipelines – face & voice emotion recognition



- **PhD- Soft skills training (awareness of behavior) (training (a) 'non-verbal' & (b) intonation)**
- **Stress & Learning: Emotional state (ES)**
- **Others sensors for ES (posture,)**
- **Combine ES & Cognitive State**



Discussion & Questions



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Thank you for your attention ...

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