MADE-Dashboard:





Visual Analytics for Multimodal Affective Educational Software

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learner's emotions

happy (2min 41sec)
sadness (1min 25sec)
surprised (0min 15sec)
angry (0min 0sec)
disgusted (0min 0sec)
fear (0min 0sec)

sadness

Shows user

proportions

of emotions

in specific

time periods

happy

Challenge: How can theoretical models of Human-Computer Interaction (HCI) inform affective multimodal education.

Approach: Need for software to support teachers in monitoring students to provide and engage students in learning with different affective strategies

Why MADE:

MADE Framework (Multimodal Affect for Design and Evaluation) [1]

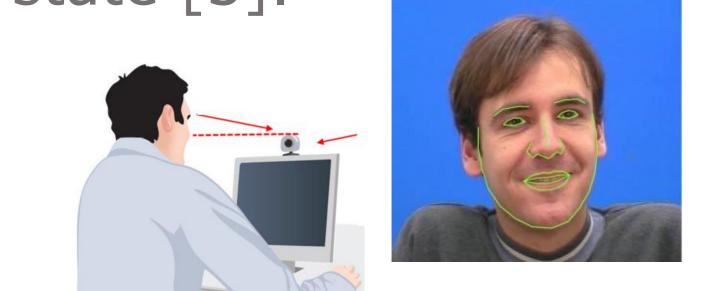
- Design Process: Goal-Directed Design (Affective) Personas) and Usage-Centered Design (Affective Essential Use Case)
- > Inspection Techniques: MADE Walkthrough and MADE Heuristics

Why MADE-Dashboard:

teachers monitor classroom students' emotional reactions while learning, but this is difficult with educational software used online: the MADE Teacher's Dashboard addresses this gap.

Emotion Detection:

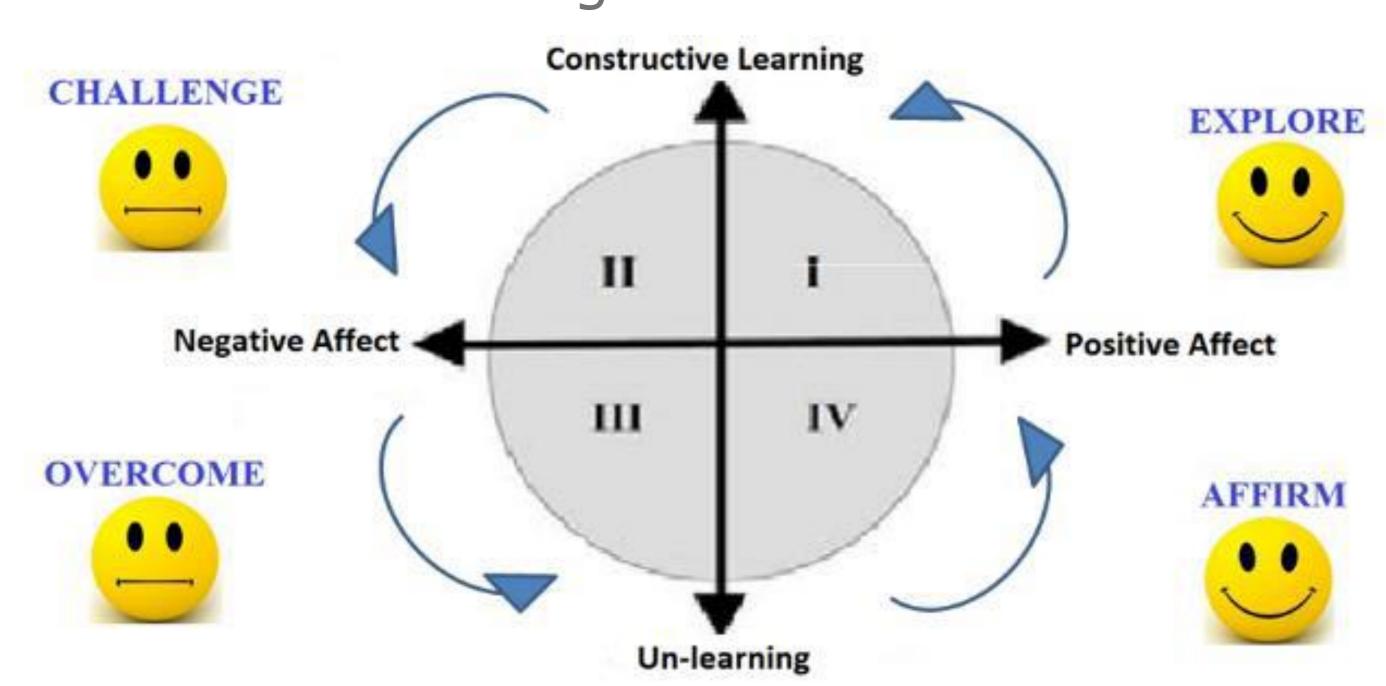
Clmtrackr: Open source software that uses computer vision that recognizes emotional state [3].



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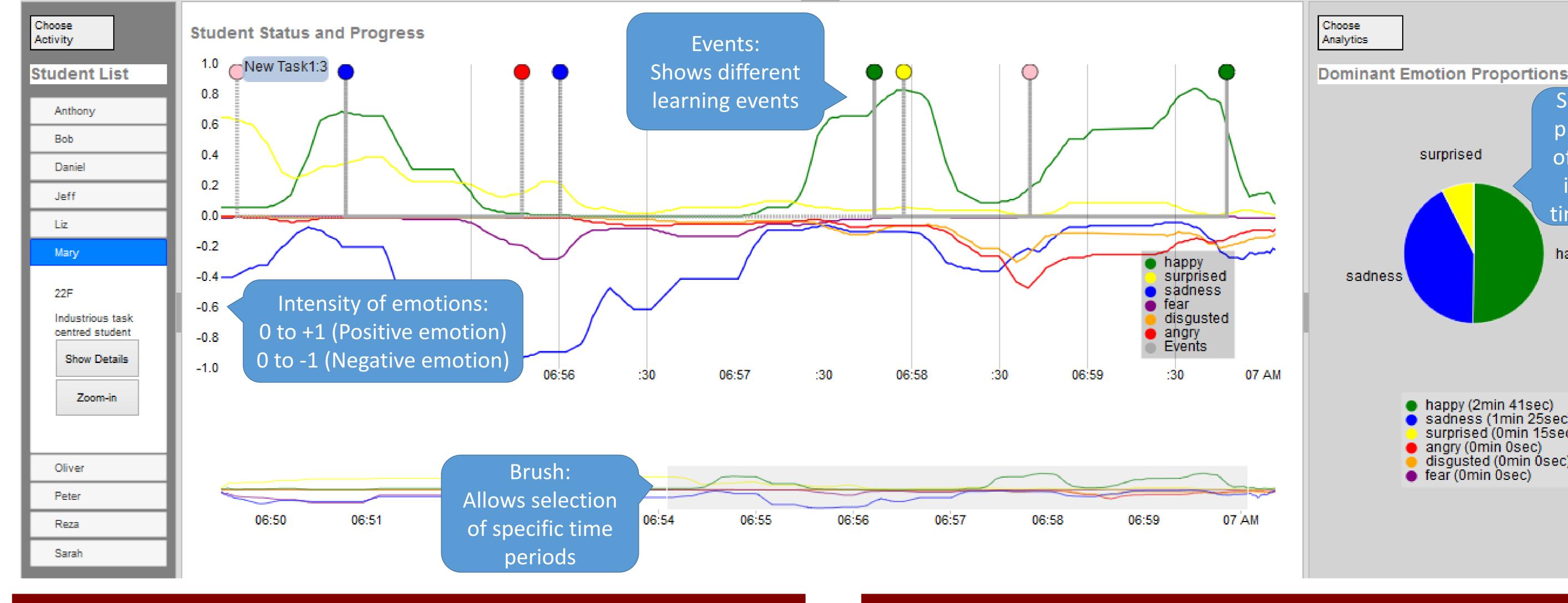
Underlying theory:

The affective model of education from Kort et al. [2] includes four phases of emotion desirable in learning:



Architecture: Data base of the learner model (Affective status + 1:1 pedagogical state + facial expression) Student's screen SQL Case Study Teacher's Dashboard Teacher asks for Web Server Server asks Learning math and student affective Low-fidelity prototype for data finding ratios using Leap data to display Motion Controller REST REST Case Study Sharing a story using Data sent to Data sent to Museum Explorer Software Using teacher web server Visual storytelling Case Study JS/XML/JSON/CSS/HTML/SVG with D3 Using Carleton Virtual 3D JQuery/D3/Raphael environment JavaScript with D3 Functional Prototype: Visualization Framework C Q Search mvp.soft.carleton.ca/made/teacher/console.html Facial gesture monitoring of

MADE Teacher's Dashboard — Multi-Dimensional Emotion Analytics



References:

- [1] Reza GhasemAghaei, Robert Biddle, and Ali Arya. The MADE Framework: Multimodal Software for Affective Education, AACE, EdMedia2015
- [2] Barry Kort, Rob Reilly, and Rosalind W. Picard. An affective model of interplay between emotions and learning: Reengineering educational pedagogy-building a learning companion, IEEE ICALT, 2001.
- [3] David Cristinacce and Tim Cootes. Feature Detection and Tracking with Constrained Local Models, BMVC. Vol. 2. No. 5. 2006.

Contributions and Next Steps:

- First use of web-based emotion tracking for education software
- User studies needed
- Studies of reliability needed