

Intelligent User Experience Engineering

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Affective ePartners

Module 12



Why do we need affective ePartners?

- Resilience in High-Demand Situations
 - Team
 - Individual
- Persuasion of desired behavior
 - Adhering to procedures, therapy, ...
 - Motivating and personalizing
 - Coaching and educating
- Sensible feedback
 - Understanding individual's state
 - Addressing intention *and* emotion
- Gaming ...

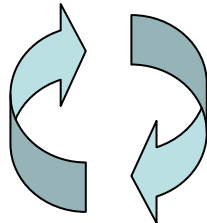


Affective Mirror

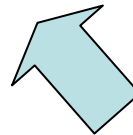
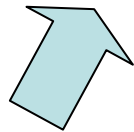


Mediating Emotions

Complete cycle:



- perceiving
- interpreting
- evoking

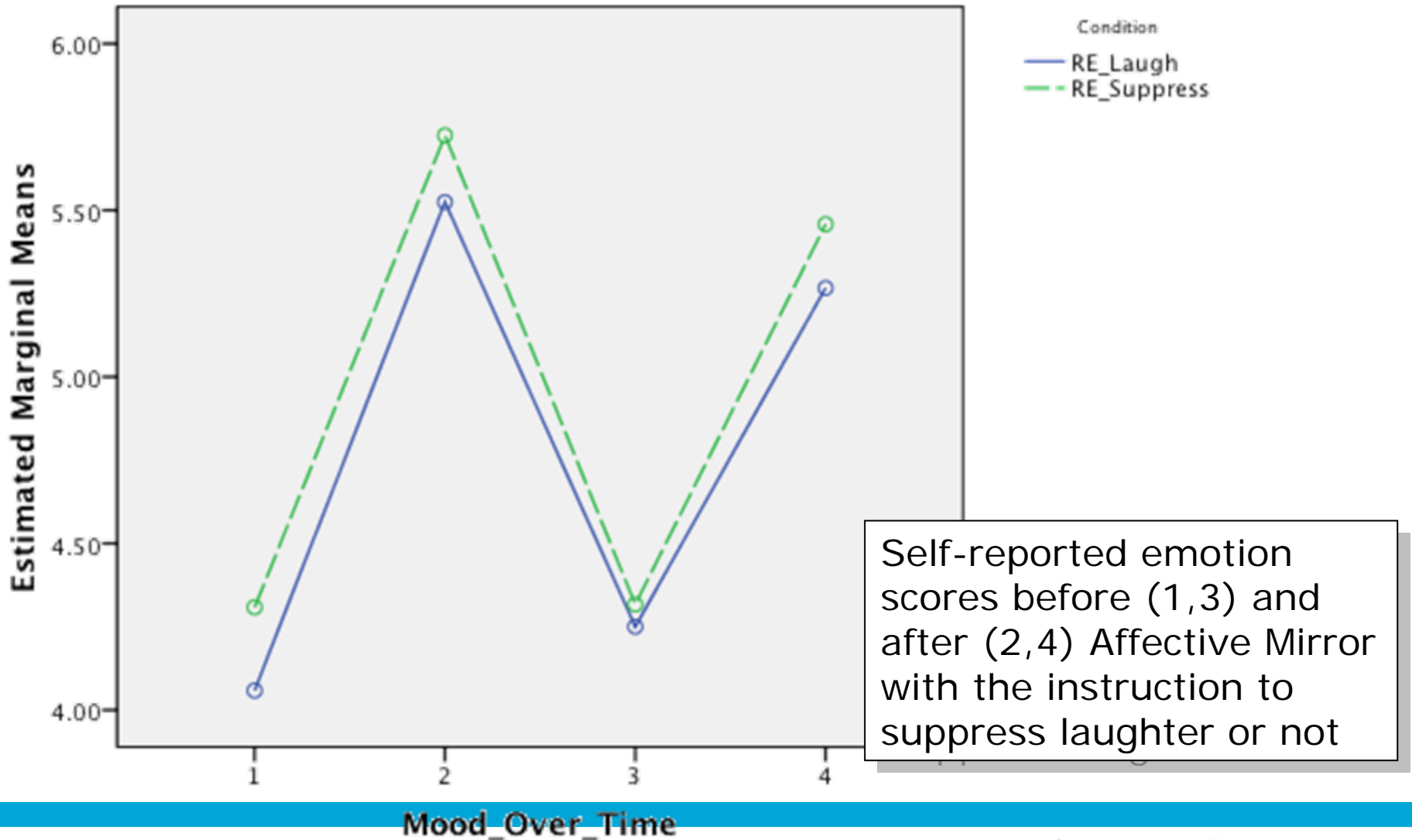


Repeated Interaction

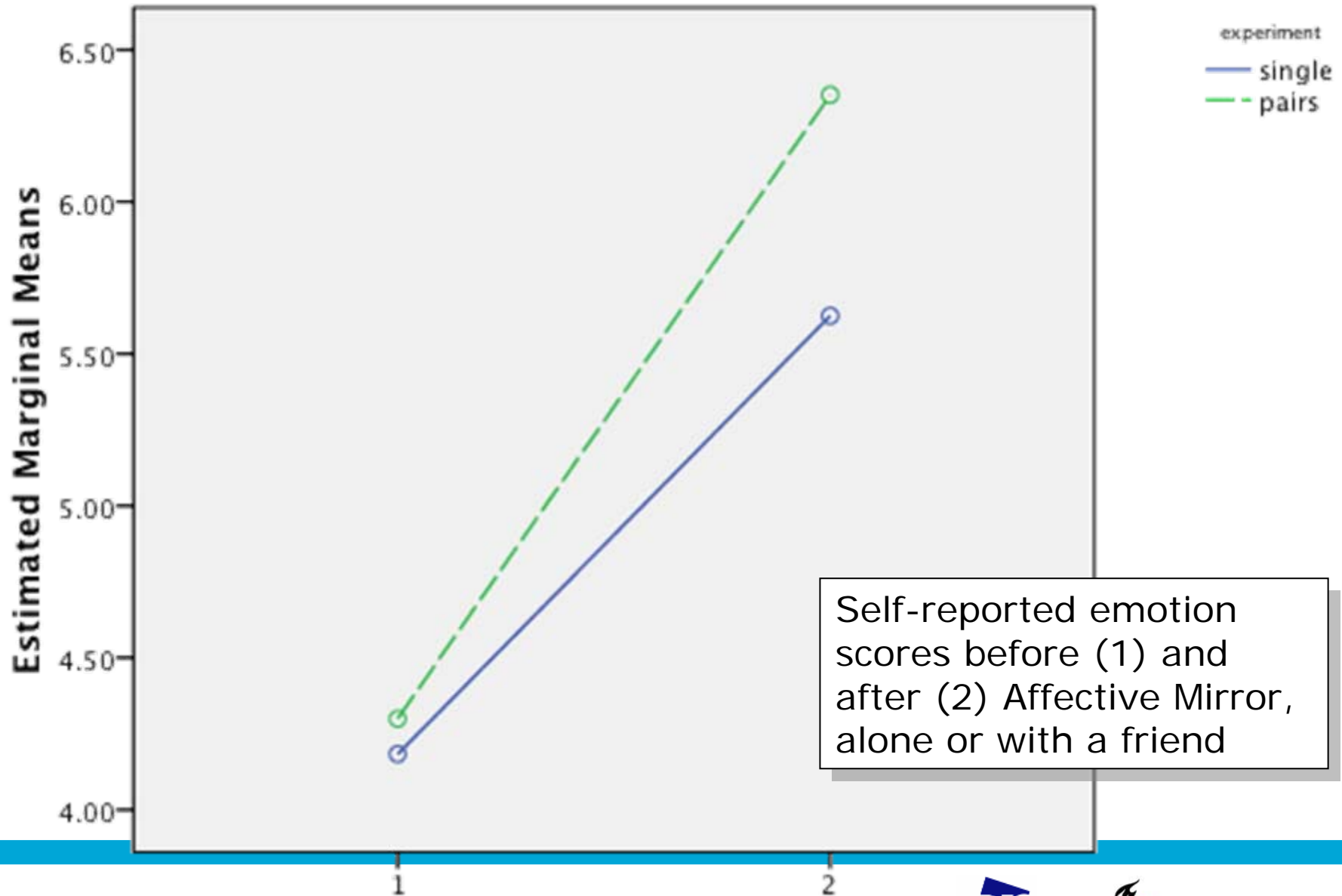
Social Context



Emotions During Repeated Interaction



Emotions in Social Context

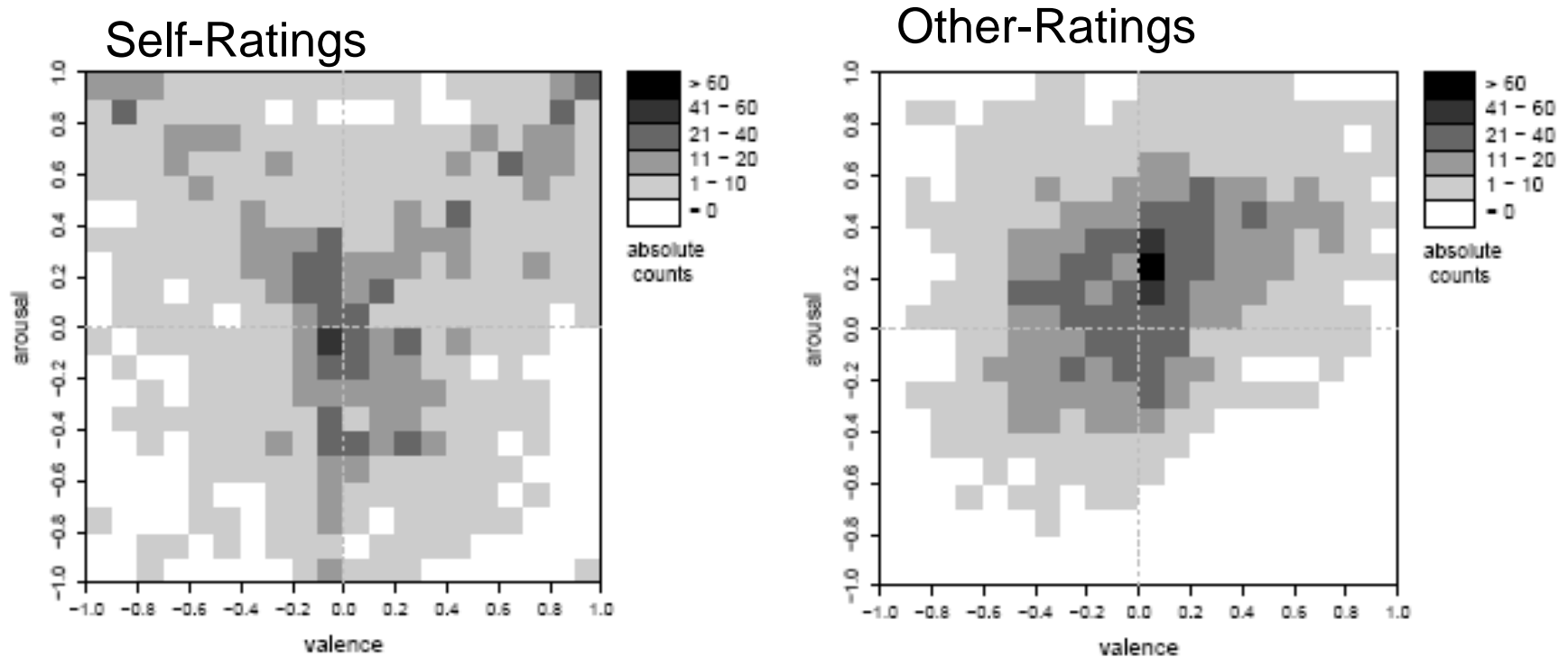


Self-reported emotion scores before (1) and after (2) Affective Mirror, alone or with a friend

Emotions during Gaming



Felt vs. Perceived Emotion in Speech



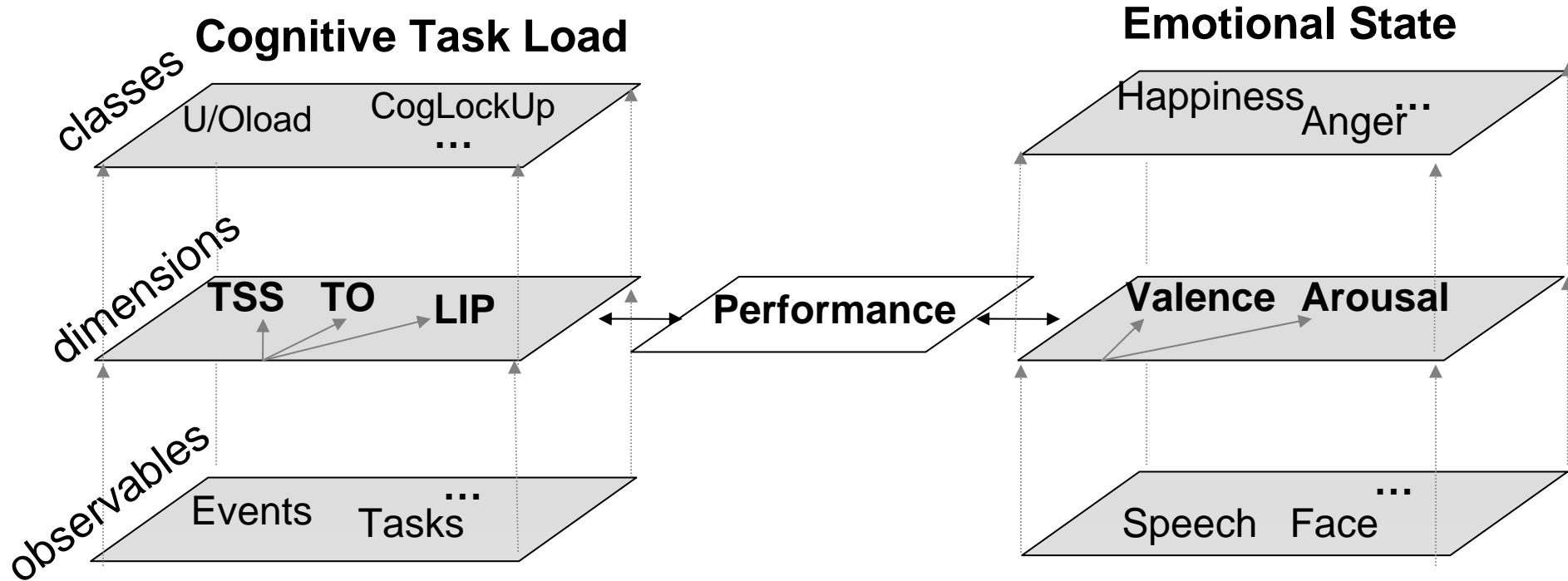
Automatic recognizer:

- performance with SELF-ratings is lower than with OTHER
- arousal can be much better predicted than valence

Emotions and Cognitive Task Load



Modeling Cognitive Task Load and Emotion



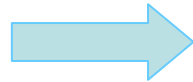
Cognitive Task Load and Performance (research in progress)

Cognitive Task Load (CTL)

- Time occupied
- Task complexity
- Task switches

For CTL, a Bayesian network provided performance estimations with 86% resp. 74% accuracy for laboratory and “real-world” ship-data.

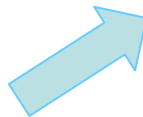
Emotion



Human Performance



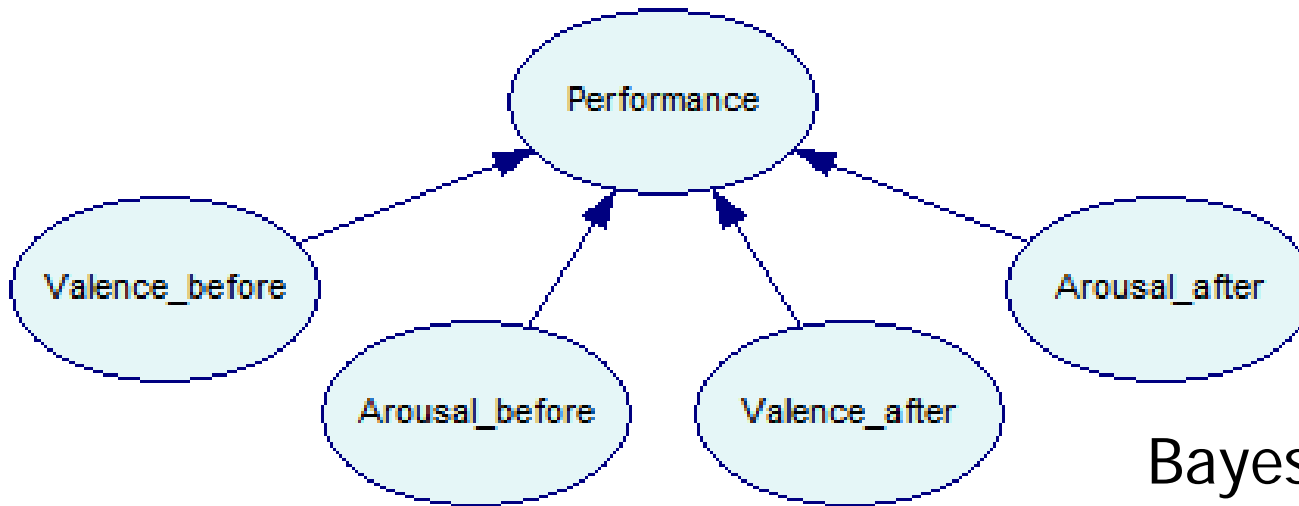
Social Involvement



Fitness

	Prediction	
Actual	low	high
low	50	0
high	14	36

Emotion and Performance (research in progress)

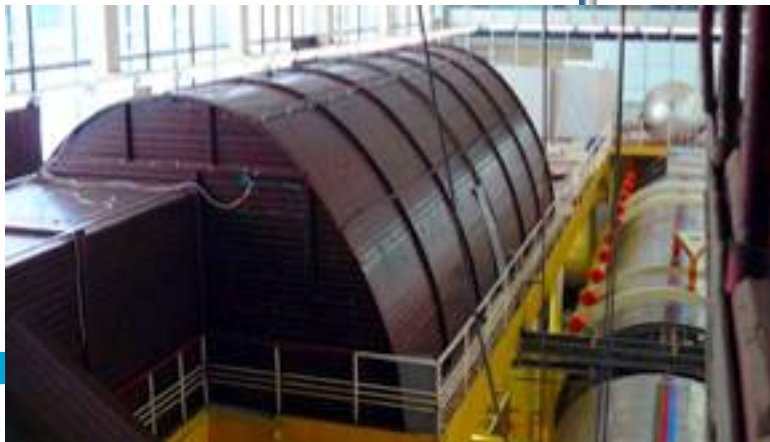


Bayesian Network

Predicted \ Actual	Low	High
Low	209	36
High	62	160

Percentage
classified correct:
79.0%

Feedback during Gaming in MARS-500




m500 - M500 v1.0.2

File View Options Help

Default (R)

M500 (v1.0.2) main console - Hermann

This is the main console for the M500 application. From this window you can initiate all the activities related to the M500 experiment.



Session

You are logged in as: Hermann

Tasks


- Start Colored Trails
- Start COLT (teacher role)
- Start COLT (student role)
- Start Lunar Lander


Utilities

- Start Spark chat client


History of cognitive status


Emotion


Arousal 

Valence 


Cognitive Task Load

Level of Information Processing 


Task Set Switching 


Time Occupied 

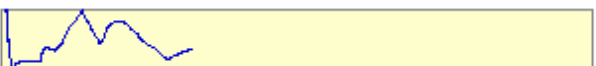
Task scores

Colored Trails 

COLT

Teacher 

Student 

Lunar Lander 

Emotional Synthetic Characters

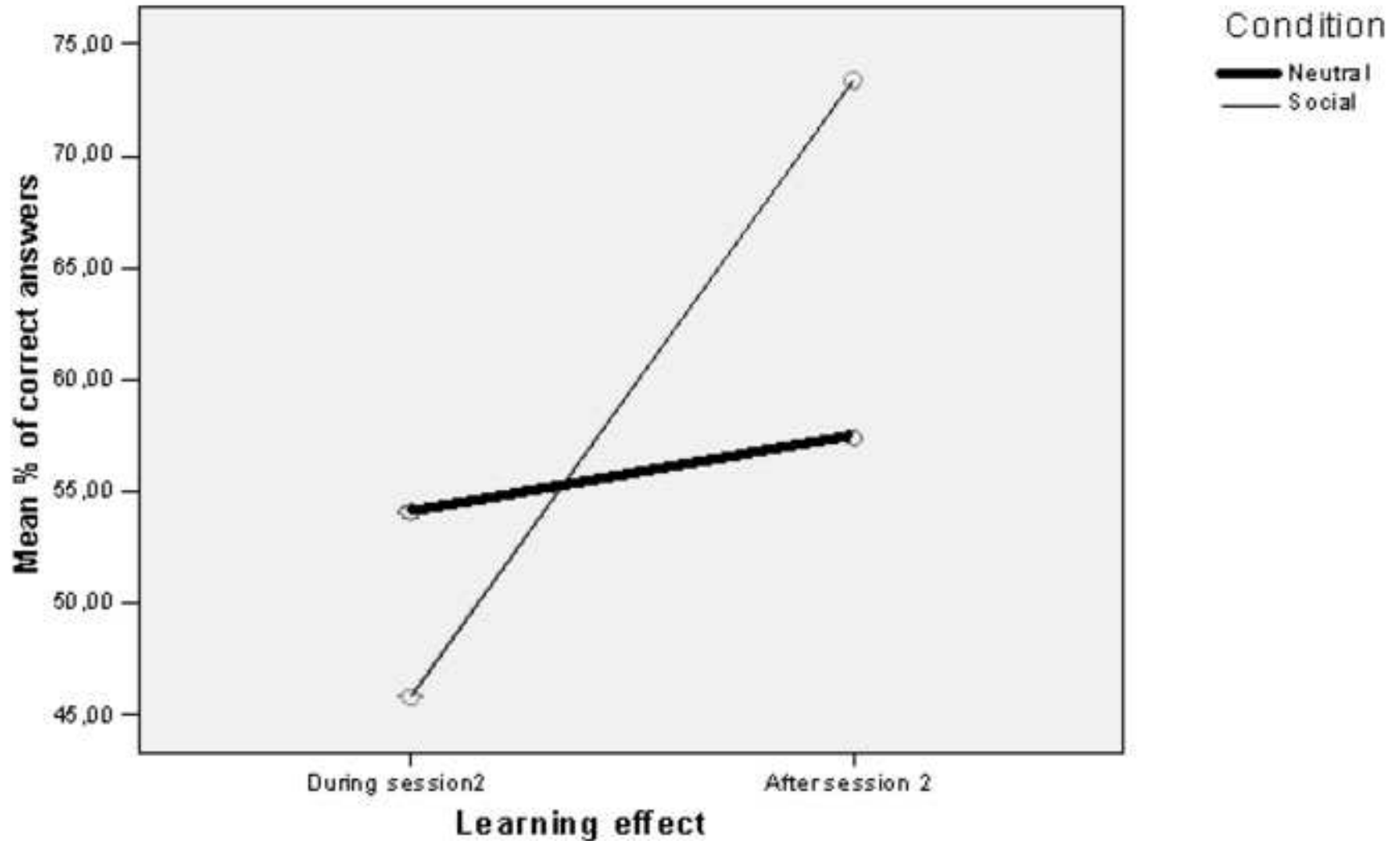
- Humans express less emotions in chat with computer assistant than with human assistant
- And with an emotional robot?
- iCat
 - Face
 - Speech



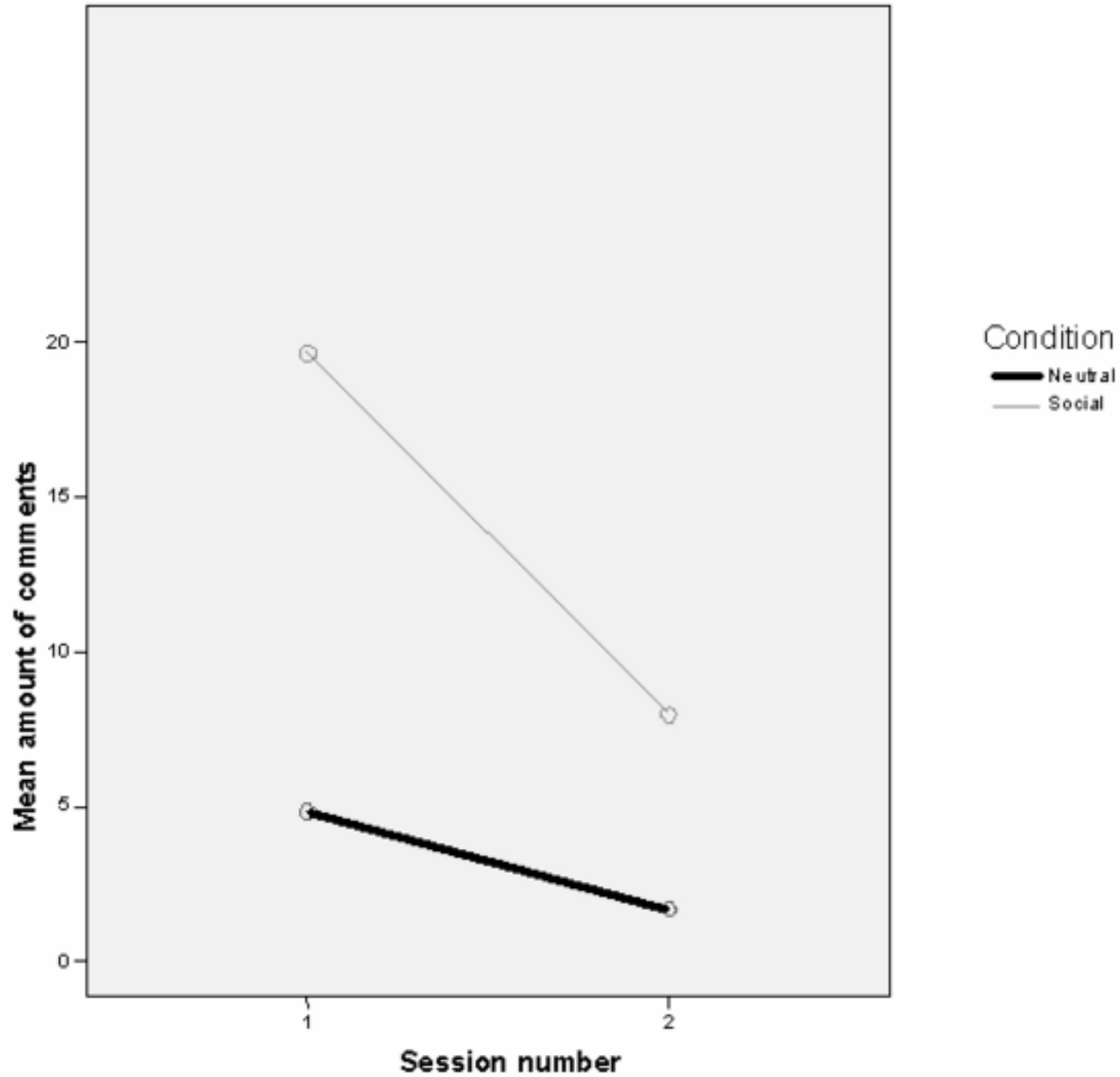
Motivating, Educating and Gaming



Emotion and Learning



Repeated Interaction



ePartner for Persons with Overweight

Bewegingsdagboek - Microsoft Internet Explorer provided by KG Defensie & Veiligheid

http://riga.twi.tudelft.nl/index.php?page=dayviewactivity

File Edit View Favorites Tools Help

Bewegingsdagboek



Levensstijldagboek

- Home
- Instellingen
- Kalender
- Voedingsdagboek
- Bewegingsdagboek**
- Rapport
- Tabel voedingswaarden
- Links
- Handleiding levensstijldagboek
- Deelname reglement

Ingelogd als: Kim

Uitloggen

Bewegingsdagboek

Bewegingsdoel details



U selecteerde als beweegdoel: "Probeer dagelijks minstens 30 minuten licht intensief te bewegen, bijvoorbeeld lopend boodschappen te doen, trap te lopen, of te tuinieren."

Gefeliciteerd! U hebt uw doel voor vandaag bereikt. U hebt vandaag licht intensief bewogen.

Terug naar overzicht

Invullen Bewegingsdagboek - donderdag 22 Mei 2008

selecteer datum 

See Module 6

ochtend

 Huishouden 30 minuten

[nieuwe activiteit toevoegen](#)

activiteiten

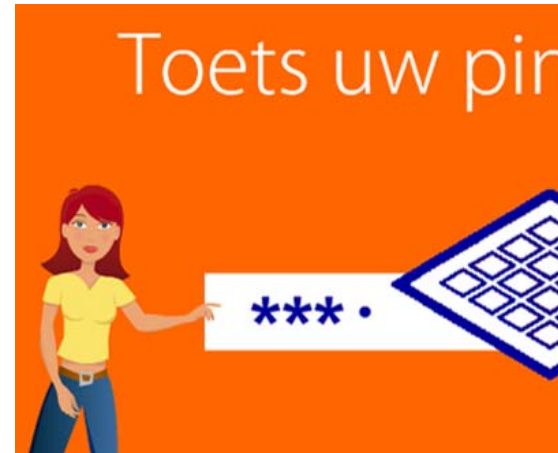
Activiteiten invoeren

-  Bewegmoment
-  Kies categorie
-  Zoek activiteit

ePartners for Universal Accessibility

ATM for illiterates

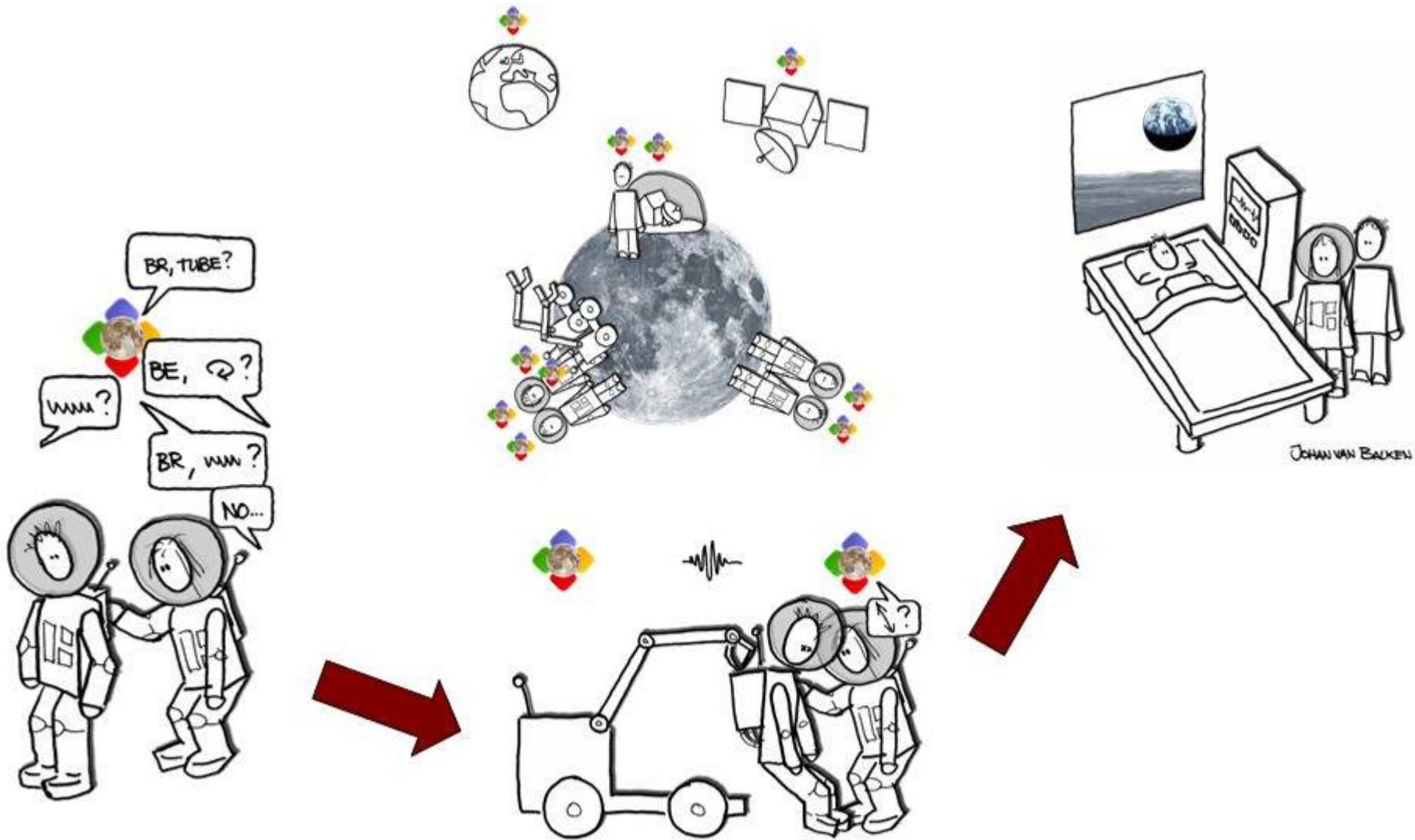
- Steffie



- Ashley

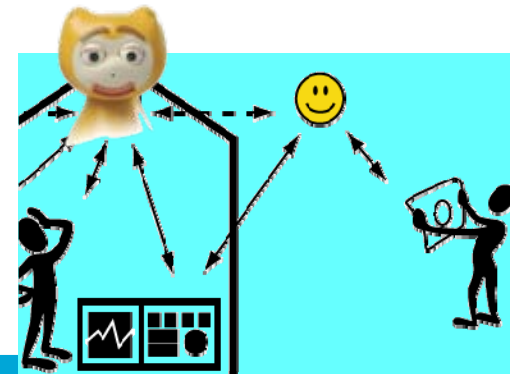
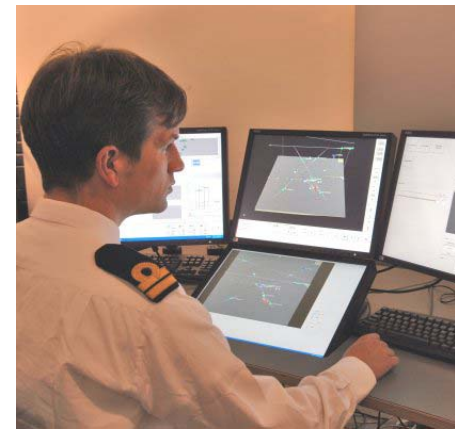


ePartners for Astronauts



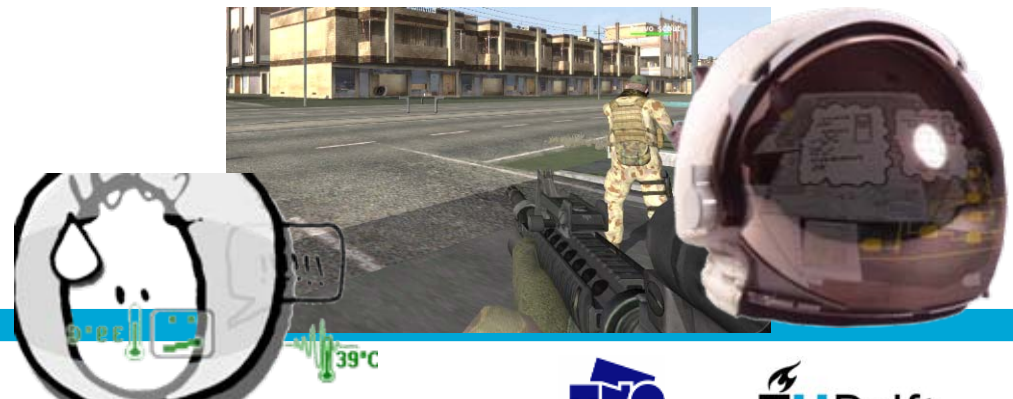
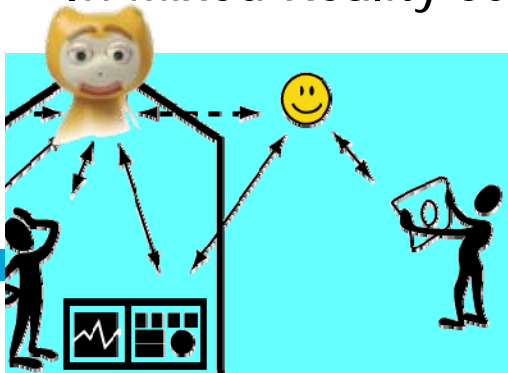
Some results

- Adaptive interface
 - affective mirror
 - ship control centre
- Requirements Baseline for Synthetic Emotion Mediators of astronauts
- Cognitive Task Load and Emotion models that predict complex human performance
- Social robot (showing appropriate emotions):
 - viewed as empathic
 - evokes more effort
 - dialogue style is best:
 - cooperative for “normal” situations
 - directive for (time-)critical situations



ePartners To Appear...

- Supporting work organization and supervising performance
- Attuning task allocation & support to task load & emotion
- Providing adaptive feedback for personal training, performance and well-being objectives
- In Mixed Reality settings



Some Discussion Statements

- ePartners are non-human
 - Some information processes are inspired by human cognition
 - Other processes utilize specific computer technologies
- => they are a new kind of social actors
 - ePartners are adaptive and evolve by learning from their environment (incl. the humans)
 - Humans are adaptive and will learn from the ePartners
- => a new (hybrid) social environment arises

So, affective *e*Partners support collaboration by...

Attuning their actions to

- **P**ersons: Individual characteristics and momentary conditions of their human (*h*)Partners
- **A**ctivities: Tasks and goals of their *h*Partners
- **C**ontext: Social and physical environment
- **T**echnologies: The “machines” that may support persons’ activities in the current context

Sharing PACT-knowledge with *e*- and *h*-Partners

Showing intentions and emotions that the *h*Partners recognize

Literature

Current Lecture (module 12):

- Picard, R.W., (2000). Toward computers that recognize and respond to user emotion. *IBM systems journal*, 39 (3-4), 705-719.

Next Lecture (module 13):

- Neerincx, M.A. (forthcoming). Situated Cognitive Engineering for Crew Support in Space. *Personal and Ubiquitous Computing*.