

Comparability is Key to Assess Affective Architectures

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disclaimer/acknowledgements: see last slide.

window

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- S5 themes are designed for full-screen display areas with a 4:3 aspect ratio.
- Created with [Docutils \[1\]](#)/[reStructuredText \[2\]](#) and [S5 \[3\]](#).

What Are We Doing?

“Theories of human emotion provide essential insight into the design and control of intelligent entities in general”

- Computational models of emotion to be used in intelligent agents
- *Affective Architectures*

- Why should we call it emotion?
- Which parts of different agents can be called *arousal*, *appraisal*, *anticipated affect*, *surprise*, ... and why?

Speaker's notes

I will not present a specific agent architecture today but I rather like to take a step back and ask some questions that pertain to all architectures. start with a quote.

models of emotion that can be used in a computer system. supposed to help for example in allocating and focusing mental resources

Take-Home Message

Open questions:

- What justifies referring to artificial mechanisms as emotion?
- What warrants emotional mechanisms in agent architectures?

Detailed scenarios of use

- Help to compare architectures targetting different functionalities
- Explicate the functional role of emotion

Speaker's notes

necessary to provide detailed scenarios of use. <s>

make explicit what kind of emotional functionality is wanted in an agent.

Labelling with emotional terms

What parts are there?

- Data structures
Emotion objects, arousal level, appraisal components per event
- Processes
Appraisal process(es), comparison process for motivational value
- Interaction of processes
“The synchronised recruitment of resources”,
“A change in action readiness”

Speaker's notes

interaction of processes as corresponding to **specific phenomena**

What is a Model For?

- Always a view on a small section of a whole.

Models can only be understood (and evaluated) with respect to a given level of description and associated criteria

- Descriptive vs. explanatory models

Main advantages of computational models?

- *Interactive modification*
- *Probing and prediction*

Speaker's notes

A model can only capture part of the system it wants to model. The missing pieces are often implicit, and they need to be - to constrain complexity.

Just as the systems they model, the models can only be understood (and evaluated) with respect to a given level of description and a specific set of criteria associated with that level.

[CleeremansFrench1996] (chicken squawking example?)

A computational model is forced to provide mechanisms, but it is not automatically an adequate explanatory model.

UNUSED IN TALK (also [CleeremansFrench1996]):

Two types of explanatory models:

- use the same conceptual elements that are appropriate for describing phenomena as the representational and processing medium
- connect to a lower level of description

Functions of models:

1. simple existence proof
2. demonstrate new capabilities
3. unify an existing body of empirical and theoretical research (example: Soar)
4. probing and prediction (specify the criteria for testing the model)
5. interactive modification

The Scenario-based Approach

- Scenarios in Usability: capture the requirements

Emotion: What are situations / phenomena that we target?

- Psychologist: e.g. experimental data on human behaviour
- AI Researcher: e.g. multi-step decision making
- Engineer: e.g. believable real-time interaction
- Sociologist: e.g. data on strategies in social interaction

Basis for asking: What are the functionalities wanted?

Speaker's notes

Scenario-based design and evaluation is a technique of usability engineering. Its purpose is to capture the relevant details of the situations you want to test a system in.

For emotion models this could be the details of the phenomena that the model is supposed to model. You can regard human emotions (or maybe idealised human emotion and intelligence) as the system that we aspire to understand; but the model is targeted towards a specific subset of this.

Scenario-based Comparisons

- **Range of emotional phenomena**

Modelling fear vs. modelling fear, anger, and guilt

- **Interaction with humans**

None vs. simulated vs. (restricted) dialogue

- **Interaction between agent and environment**

Discrete simulation with infallible action vs. situatedness

- **Tasks and performance measures**

Agents exploring an environment: efficiency vs. realism

- **Reportable Emotion Experience**

What is a Scenario then?

A point in the *niche space* for affective agents

Possible purpose and environment of use

- Motivation and purpose
- Details of possible deployment
 - Number and types of agents
 - Interaction qualities (including user interface)
 - Agent tasks
 - Environment properties
 - Possible (emotional) interactions, scripts

The End

Thank you for your attention!

Questions?

Or Answers? • How do you justify using emotion terms? • Are scenarios helpful for bridging

The following slides contain anticipated questions (AQ).

AQ: Not Enough Detail

But there is not enough detail in such a scenario, it is not formal enough, to allow productive comparisons?

Scenarios are not intended to be formal verification tools, but should serve as a coordination tool for research efforts.

As such, they should not be too detailed, but iteratively adapted or spawned.

Disclaimer and Acknowledgments

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Keyboard Controls

The following apply in any supporting browser besides Opera, which uses the default Opera Show controls instead.

| Action | Key(s) |
|---|---|
| Go to the next slide | <ul style="list-style-type: none">• [Space bar]• [Return]• [Enter]• [Right arrow]• [Down arrow]• [Page down]• Click the left mouse button outside of the control area, Flash object, or movie |
| Go to the previous slide | <ul style="list-style-type: none">• [Left arrow]• [Up arrow]• [Page up] |
| Go to the title (first) slide | [Home] |
| Go to the last slide | [End] |
| Jump directly to a slide | Type the slide number, then hit [Return] or [Enter] |
| Skip forward n slides | Type the number of slides to skip, then hit any "go to next" key (except [Return] or [Enter]) |
| Skip backward n slides | Type the number of slides to skip, then hit any "go to previous" key |
| Switch between slideshow and outline view | <ul style="list-style-type: none">• [T]• Click the \emptyset button |

| Action | Key(s) |
|--------------------------|---|
| Show/hide slide controls | <ul style="list-style-type: none"><li data-bbox="868 120 938 147">• [C]<li data-bbox="868 152 1423 224">• Move the mouse pointer over the control area |

Further details of the S5 user interface can be found at [Eric Meyer's S5 page \[3\]](#).

References

- [CleeremansFrench1996] ([1](#), [2](#)) Cleeremans A., French R.M.: From Chicken Squawking To Cognition: Levels of Description and the Computational Approach in Psychology, *Psychologica Belgica*, 36(1-2):5-29, 1996.

Links

- [1] <http://docutils.sourceforge.net/>
- [2] <http://docutils.sourceforge.net/rst.html>
- [3] ([1](#), [2](#)) <http://meyerweb.com/eric/tools/s5/>
- [4] <http://www.ofai.at/~paolo.petta/conf/ace2006/>