

# humaine

WP 7: Emotion in Cognition and Action

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WP7 Workshop, July 4-5 2005, London

# WP7 objectives

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- **Scope: investigating / understanding computational models of emotion influences in cognition and action**
  - ➔ Enhance behavior & interactions of emotion-oriented systems
  - ➔ Feedback to emotion theorists (synthetic approach, operationalization)
- **Horizontal goals**
  - ➔ Achieve shared understanding of basic issues and research topics
    - Key problems, conceptual issues & application scenarios
    - Critical analysis of approaches & systems (assumptions, dependencies)
    - Analysis of needs and directions for future research and applications
    - Evaluation methods, scenarios, tools
    - Potential for cross-fertilization among disciplines
  - ➔ Set grounds to advance the state of the art (exemplar)
  - ➔ Disseminate achieved research results and gained insight

# Months 1-5 (D7b): state of the art, analysis (1)

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- ◆ Review of key achievements:
  - ➔ Emotion-based architectures (action selection, learning, memory)
  - ➔ Appraisal-based and cognitive systems
  - ➔ User modeling
  - ➔ ECAs and virtual environments
- ◆ Key conceptual problems for emotion-oriented architectures:
  - ➔ Mechanisms underlying the involvement of emotions in cognition and action
  - ➔ Emotion elicitors (which factors activate those mechanisms?)
  - ➔ Emotions as cognitive modes
  - ➔ Relations among emotion, value systems, motivation and action

# Months 1-5 (D7b): state of the art, analysis (2)

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## Key integration challenges

- ➔ Problems arising from theories and models (diversity, poor understanding)
- ➔ Diversity of computational frameworks & modeling approaches
  - Embodied AI, dynamical systems
  - Symbolic AI
  - Hybrid systems
  - Social simulation

## Key development goals

- ➔ “Grounding problem” of artificial emotions => “meaningful” emotions?
- ➔ Dissolving the “mind-body” problem
- ➔ Untangling the “knot of cognition”: links emotion – intelligence
- ➔ Measuring progress & the contributions of emotions to our systems

# Months 6-11 (D7c): approach to exemplar

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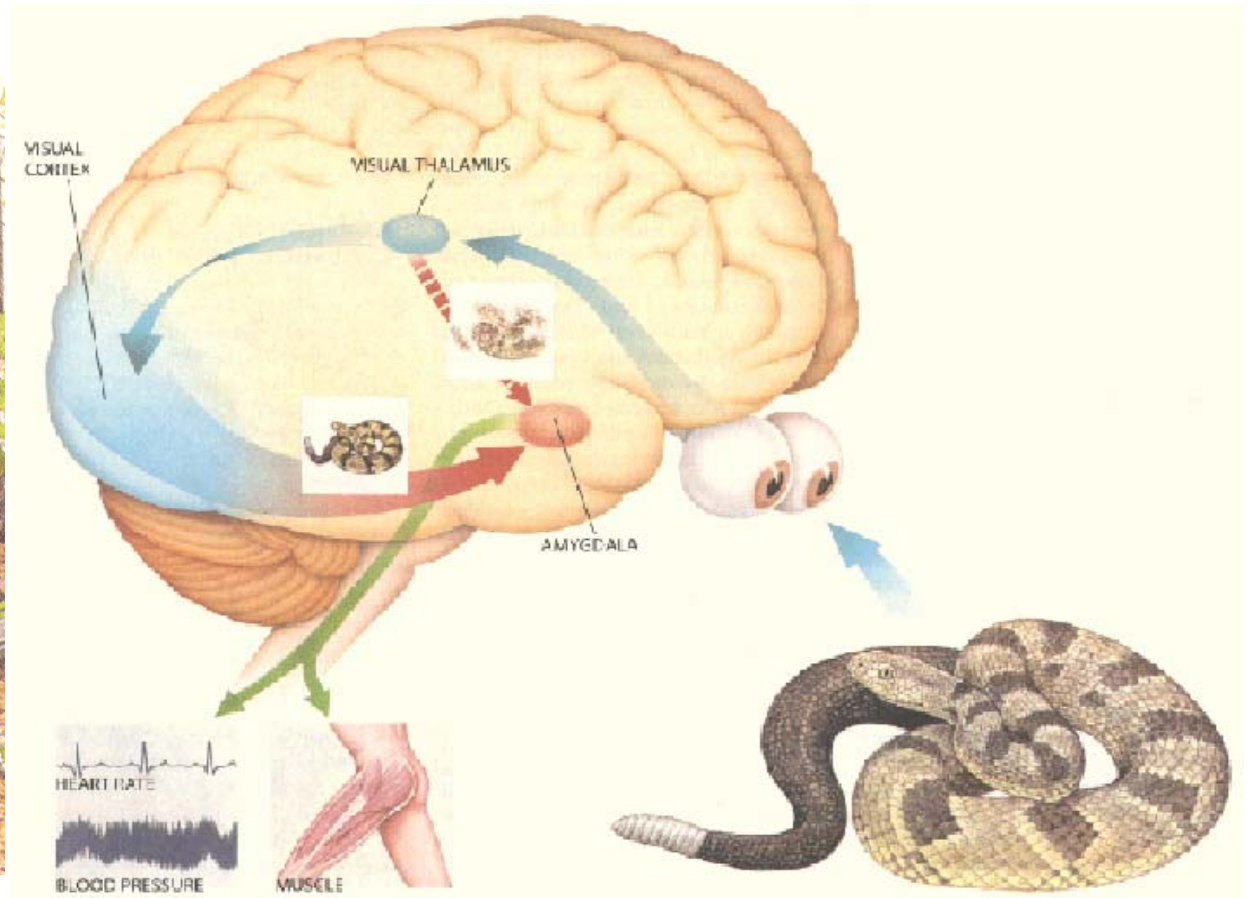
- ◆ Best approach to fulfill horizontal goals in our area:
  - ➔ *Comparative approaches to emotion-oriented architectures: assumptions, integration challenges, and guidelines for future research*
- ◆ Key ideas:
  - ➔ “Comparative approaches”
    - welcome the diversity of conceptual and computational models and frameworks
    - de-emphasize idea of a “unified” model for an emotion-based architecture (misleading goal at this point) -> complements “blueprint”
  - ➔ “Assumptions, integration challenges and guidelines for future research”
    - stresses the nature of our principled integration effort in setting sound grounds

# Months 6-11 (D7c): elements of exemplar

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- ❖ **Focused working groups**, integration at various levels:
  - ➔ *Element 1*: Emotion in “lower-level” (embodied) cognition & action
    - UH, GERG, *CNRS EPML 38*, KCL
  - ➔ *Element 2*: Emotion in “higher-level” (reflective) cognition & action
    - Uni. Bari, FT-RD, GERG, *CNR-ISTC*, *USC*, DFKI, QUB, UA
  - ➔ *Element 3*: Bridging gap between “lower-” & “higher-level” C & A
    - OFAI, HW, INESC-ID, IST, EPFL, DFKI, *USC*
  - ➔ *Element 4*: Emotion in Social Cognition and Interaction
    - OFAI, UH, Paris8, MIRALab, EPFL, DIST, DFKI
- ❖ **Output:**
  - ➔ Edited book (journal issue?)
  - ➔ Reflection based on (proof-of-concept) designs and implementations

# The four elements ...



# Dissemination & “external” activities

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- ✦ Symposium “Architectures for Modeling Emotion”, AAAI Spring Symposium, Stanford, March 2004
- ✦ Symposium “Dimensions of Sociality”, Vienna, Nov. 2004
- ✦ Symposium “Motivational and Emotional Roots of Cognition and Action”, AISB’05 @ UH, April 2005
- ✦ Symposium “Mind-Minding Agents”, AISB’05
- ✦ Co-organization (with WP3) symposium “Architecture of Computational Models” at ISRE in Bari, July 2005
- ✦ Special session at “User Modeling” 2005 conference
- ✦ Co-edition (with WP6) special issue Intl. Journal Humanoid Robots
- ✦ Various press reports, numerous scientific articles published or submitted (e.g. contribution to special issue NNets “Emotion Understanding and Recognition”)

# Support to Network activities

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- ◆ Presentations and posters at Plenary 1 & Plenary 2
- ◆ Presentations at WP3 workshop: “Contributions from robotic models of emotions” & several “hands-on demonstrations”
- ◆ Presentations at WP4 workshop: links wp7-wp4, Markov-based analysis
- ◆ Presentations & posters at WP6 workshop (ToM, affect-based imitation)
- ◆ Cross-WPs links (meetings in Saarbruecken, Geneva, Santorini, Paris):
  - WP3, blueprint; conceptual clarification
  - WP4, constraints from cognition-action to signals/signs processing
  - WP6, integration internal models-expressive behaviors
  - WP8, mental states underlying external manifestations of persuasion
- ◆ Co-organization (with WP3) of symposium on architectures of computational models at Plenary 2, May 2005
- ◆ Working visits (UH & ÖFAI to GERG & MIRALab, HW to ÖFAI, etc)
- ◆ Support actions (sessions) to WPs 3, 6, (8) at workshop (July 2005)

# Exemplar: Planned program of activities

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## **Stage 1: Critical analysis of state of the art and needs**

Months 1 - 18: iterations to define exemplar; uncover assumptions and needs

- ✓ “assumptions” questionnaire
- ✓ papers and discussion sessions
- ✓ WP7 session @ Plenary 2 => agreements on concrete challenges & outputs

## **Stage 2: Integration challenges and key development goals**

➤ *Month 19: workshop, July 4, 5, London => final decisions on exemplar*

Months 19-30: theoretical and practical work on integration challenges

Months 31-39: theoretical and practical work on integration challenges

## **Stage 3: Conclusions and guidelines for future research**

Month 40: start guidelines for future research; chapter proposals and abstracts

Month 43: drafts of chapters due

Months 44-48: chapters reviewed and revised; book to publishers M 48

# Aims of this workshop

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- ◆ Focus on *joint work*, different form of interaction starts
- ◆ Final decisions: *concrete directions & activities* for exemplar
- ◆ Outline Month 22 (October) deliverable (formerly for M18)
- ◆ How to meet our *horizontal goals*? Ideas & commitments:
  - ➔ Assumptions (joint work of WGs around questionnaire)
  - ➔ Integration challenges
  - ➔ Guidelines for future research
  - ➔ Measuring progress: towards standards
- ◆ Plan for *outcome* of exemplar: book & systems/designs
  - ➔ Possible chapters (plan joint work)
- ◆ *Support actions* from / to Network (visits, meetings, ?)