IMMEDIATE – response to reviewers' comments

www.cs.vu.nl/∼eliens/research/immediate.html

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Our answer to the reviewers' comments will be given by underlining the premisses governing our work and the IMMEDIATE project. Also additional references will be given to demonstrate our research experience in the field.

1. our approach has a strong foundation in software engineering

We have a strong background in OO and distributed logic programming. Nevertheless, we have previously published in areas as diverse as multimedia, information visualisation and agent systems. Currently we do have a platform that is unique in the Dutch situation and also gained international acceptance.

2. we believe in experimental research

To this end we develop demonstrators that act as a vehicle to tackle intricate research issues, both pragmatic issues and theoretical issues. This approach promotes the development of technology together with gaining theoretical insights.

3. our work has strong theoretical underpinnings

Both dr A. Eliëns and dr Z. Huang have a strong background in theory, respectively theoretical computer science and logic for artificial intelligence. See the additional references given below, of which (3), (8) and (10) are refereed journal publications.

4. our platform is uniformly logic-based

- DLP+X3D – platform based on distributed logic programming
- STEP – scripting language based on dynamic logic
- IMMEDIATE – transaction primitives to be based on a logic of capabilities.

5. our system has a well-founded architecture

Our system is carefully built-up according to the layers outlined above, following sound principles of object-oriented software development.

To give a flavor of the definition of action capabilities, consider the code fragment for switching on a (domestic) object, like a TV:

```
action(switch(Object, Status), Conditions, Actions, Effects) :-
  Conditions = [
    property(Object, [position,XO,YO,ZO]),
    property(Object, [rotation,RO]),
    property(belief, [switch,Object,Button]),
    property(belief, not([status, Status])),
    property(Button, position(Xswitch,Yswitch,Zswitch))
  ],
  Actions = [
    get_in_room(Object),
    get_in_reach(XO,YO,ZO, Xswitch,Yswitch,Zswitch, RO, rightHand),
    arm_rotation(YO, Yswitch, Rarm),
    action([switch, Switch, Rarm])
  ],
  Effects = [
    change(Object, [status,Status], [status,not(Status)])
  ].
```

See www.cs.vu.nl/∼eliens/research/papers/title-interactive.html – Interactive Agents Learning their Environment – submitted to IVA (Intelligent Virtual Agents)

www.sigmedia.org/iva03/.

6. our work has gained international acceptance

There are few systems as encompassing as ours. We have not only published on Web3D conferences but also on conferences such as TIDSE03 (Technologies for Interactive Storytelling and Entertainment) and CASA03 (COMPUTER ANIMATION and SOCIAL AGENTS).

www.zgdv.de/TIDSE03/

dimacs.rutgers.edu/casa03/

Furthermore, our paper for the PRICAI-03 workshop will appear as a book chapter:

Huang, Z., Eliëns, A., and Visser, C., STEP: a Scripting Language for Embodied Agents, in: Helmut Prendinger and Mitsuru Ishizuka (eds.), Life-like Characters, Tools, Affective Functions and Applications, Springer-Verlag, (to appear).

7. we do not aim to solve the NLP problem

The NLP component is subsidiary to the functionality of the interaction primitives. For the natural language parsing we have incorporated the grail parser, that has been developed by Michael Moortgat of the University of Utrecht (who is co-supervising the thesis of our proposed candidate Michiel Hildebrand).

www.let.uu.nl/∼Richard.Moot/personal/grail.html

8. we try to avoid re-inventing wheels

Our theoretical agent model is an extended BDI model, augmented with capabilities as developed (among others) by the group of prof. dr. J-J. Meyer of the University of Utrecht. Currently, we see no need to develop yet another model, but do focus instead on achieving the functionality outlined in the demonstrators.

9. we cover a range of disciplines

Our team covers multimedia, software engineering, artificial intelligence and theoretical computer science. See www.cs.vu.nl/∼eliens/cv

The proposed candidate is a talented young student with a background in cognitive artificial intelligence (CKI, Utrecht). Moreover, we have a full-time programmer for the technical realization of our platform.

10. we are member of a school of research

We are member of SIKS. Both Prof dr. Paul de Bra and prof. dr. Anton Nijholt (whose work may, in the Netherlands, be considered as most related) may act as promotores for the candidate researcher. To disqualify the educational program of the proposal as insufficiently academic is an affront to SIKS and seems another example of reviewer number two's tendency to be led astray by his biased rethoric, favoring 'theory' over experimental research.

additional references

- (1) Mehdi Dastani, Zhisheng Huang and Leendert van der Torre, Dynamic desires In Simon Parsons, Piotr Gmytrasiewicz, and Michael Wooldridge (eds) Game Theory and Decision Theory in Agent-Based Systems, Volume 5 of multiagent systems, artificial societies and simulated organizations, Kluwer, 2002.
- (2) J. Broersen, M. Dastani, Z. Huang, J. Hulstijn, and L. van der Torre, The BOID architecture: Conflicts between beliefs, obligations, intentions and desires, Proceedings of the Fifth International Conference on Autonomous Agents (AA2001), ACM Press, pages 9-16.
- (3) John Bell, and Zhisheng Huang, Seeing is Believing: A common sense theory of the adoption of perception-based beliefs, Journal of Artificial Intelligence for Engineering Design, Analysis and Manafacturing, (1999), 13, 133-140.
- (4)John Bell and Zhisheng Huang (eds), Proceedings of the 4th workshop on Practical Reasoning and Rationality, IJCAI'99 Workshop KRR-1, 31st July 1999, Stockholm.
- (5)John Bell and Zhisheng Huang,Dynamic Obligation Hierarchies, in: P. McNamara and H. Prakken (eds.), Norms, Logics, and Information Systems, IOS Press, 231-246, 1999.

- (6) John Bell and Zhisheng Huang, Safety logics, in: A. Hunter and S. Parsons (eds.), Applications of Uncertainty Formalisms, LNAI 1455, Springer, 1998, 427-445.
- (7) John Bell and Zhisheng Huang (eds), Proceedings of the 3rd workshop on Practical Reasoning and Rationality, 24th August 1998, Brighton, England.
- (8) Zhisheng Huang and Michael Masuch, The logic of permission and obligation in the framework of ALX3: how to avoid the paradoxes of deontic logics, Journal of Logique and Analyse 149, 1997.
- (9) John Bell and Zhisheng Huang, Dynamic goal hierarchies, in: L. Cavedon, A. Rao, W. Wobcke (eds.), Intelligent Agent Systems, Theoretical and Practical Issues , LNAI 1209, Springer, 1997, 88-103.
- (10) Zhisheng Huang, Michael Masuch, Laszlo Polos, ALX: an action logic for agents with bounded rationality, Journal of Artificial Intelligence , 82/1,75-127, (April 1996).