

## **Programming and implementation plan**

### **My programming language**

I will continue developing, and will distribute my brain programming language, BAD. A key structural principle for my research is the development of a network of collaborators and the provision of a common representation and programming language by means of which scientific knowledge of brain function can be expressed and tested. The current situation is that:

(i) I have developed the first version of a programming language, which I call BAD, for Brain Architecture Description language. BAD basically allows one to construct abstract systems which consist of agents made of sets of interconnected parallel modules.

(ii) I have collaborators who also have graduate students and postdocs who will also work with us.

(iii) I have developed BAD programs - (a) programmed and tested natural language processing mechanisms, (b) programmed motivational mechanisms, and (c) am currently programming problem solving mechanisms.

(iv) I am currently creating stand-alone BAD systems: for (a) Mac OS X for collaboration with Gerard Kempen at Leiden, (b) Windows 98 for collaboration with Doris Zumpe at Emory, and (c) Solaris 7 for collaboration with Tim Shallice at UC London, also (d) Linux for Caltech. This is straightforward using Sicstus Prolog, which also has versions for other platforms such as IRIX, AIX and FreeBSD.

Thus any scientific theory of brain function will be expressed precisely in BAD, and will also be tested against experimental data obtained by my collaborators.

### **Neural representations**

I would like to develop neural nets for brain modules based on system specifications derived from my model.

As part of this effort, I am trying to develop a cortical layer level of description, where processing elements are layers. Layers tend to correspond to cell types and to genes.

### **Computer hardware implementation**

I would also be interested in exploring the idea of a parallel computer architecture based on my model. I think it may be possible to do this using only components which are associative memories with some additional storage functionality.

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