

Re: Hawkins ideas on building AI's

Source: <http://sci.tech-archive.net/Archive/sci.cognitive/2004-10/0727.html>

From: bkaz (bkaz__at_hotmail.com)

Date: 10/27/04

Date: 26 Oct 2004 21:03:21 -0700

> You're right about the "variables of patterns", and this is also how
> the 30 low-level to mid-level vision areas also work. The basic
> operations in each of these areas is probably specified genetically,
> but in a rather diffuse manner, and then they are fine-tuned via
> experience, during early development. Without some structuring, it's
> hard to imagine the 30 areas could simply self-organize to in every
> individual to perform the same functions in each case, simply via
> experience. The probability of this seems very low. And even if you
> built a computer system with a very fast memory, you would still have
> to specify the basic operations to occur in the different levels.
> Again, I doubt you would ever get the correct operations simply out of
> self-organization.

I'm not sure, but I don't think it's relevant for AI. The problem is not the memory speed per se, it's the difference between memory formation & memory retrieval speeds, – if there's no significant difference it should be faster & more economical to form variables for each pattern than to store them permanently in specialized areas & share them among patterns.

> Regards the generalization stuff, since you read Hawkin's book
> already, he has several multi-level sensory-motor-chain diagrams in
> later chapters ... doesn't his model indicate an increasing level of
> abstraction/generalization as you go up the chain on the one side, and
> back down it on the other? And that processing at the lower levels is
> more specific in both cases?

There's a contradiction, you can't build a hierarchy around generality & novelty at the same time: novel patterns by definition lack proven generality: previously accumulated match.

> > Here's where I differ with Hawkins (or with evolution?), my hierarchy
> > is not necessarily of composition, or of novelty, it is of generality:
> > accumulated/projected match of constituent patterns.

> > You may be right, bio-vision probably does those indiscriminate
> > transforms, sort of like image compression, but that's only because

sci.cognitive: Re: Hawkins ideas on building AI's

> > *it's too slow (per 'processor') to do individual pattern recognition,*
> > *which would be far more logical and 'cost-efficient'.*

> *Yeah, you can make a case that speed is the problem, but just the*
> *same, all current CV systems use a multi-level hierarchy of*
> *operations. Later ones in the chain build upon the output of the*
> *previous ones.*

Needless to say, none of those CV systems scale effectively enough to do anything interesting.

> *Just because you get a bigger faster computer doesn't*
> *necessarily mean you can get rid of this operational hierarchy. What*
> *would a single-level flat-architecture algorithm be? Template*
> *matching? Store every single possible case? Doubtful.*

You seem to be describing the exact opposite of my approach :). My hierarchy has indefinite number of levels, but the difference among them is strictly relativistic. They all use the same comparison-projection algorithm per variable of an input pattern, but those patterns have sequentially expanding syntax: spectrum of expected variables generated by lower-level comparisons.

I will post an intro to my approach on a separate thread, but forgive me if it's not very specific, – I feel I'm close enough to implementation to keep the core stuff proprietary :).

Boris.