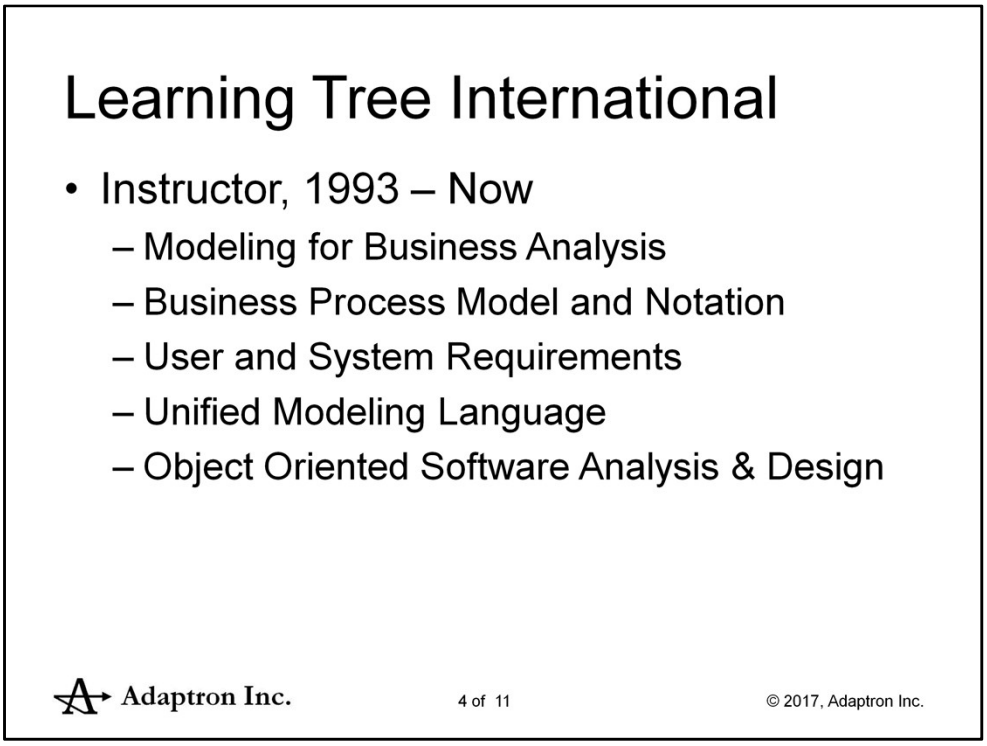
This presentation is aimed at giving you a little information about me, my company (Adaptron Inc.) and
my approach and philosophy to researching Artificial General Intelligence (AGI).
The company website is at www.adaptroninc.com
Find me on Linked-In.
E-mail me at Brett@adaptroninc.com

History and Education

- Born in New Zealand (1951)
- Canadian citizen (1967)
- University of British Columbia (1971)
  - B.Sc. (Physics)
- Queens University (1976)
  - M.Sc. (Computer Science)

I'm a Software Engineer / Computer Scientist by training.

Adaptron Inc. was incorporated in August 2002 to take advantage of the Canadian Scientific Research & Experimental Development (SR&ED) tax credit.



As an independent consultant from 1993 onward I have generated income by performing consulting projects and teaching for Learning Tree International.

Research

- Artificial General Intelligence (AGI)
  - Software that learns to do tasks that humans can perform
    - Including reasoning / thinking
    - Adaptron
- Researching AGI, 1968 – Now
- Invented Binary Neurons (Binons), 2002
- Published Perceptra, 2013[1]

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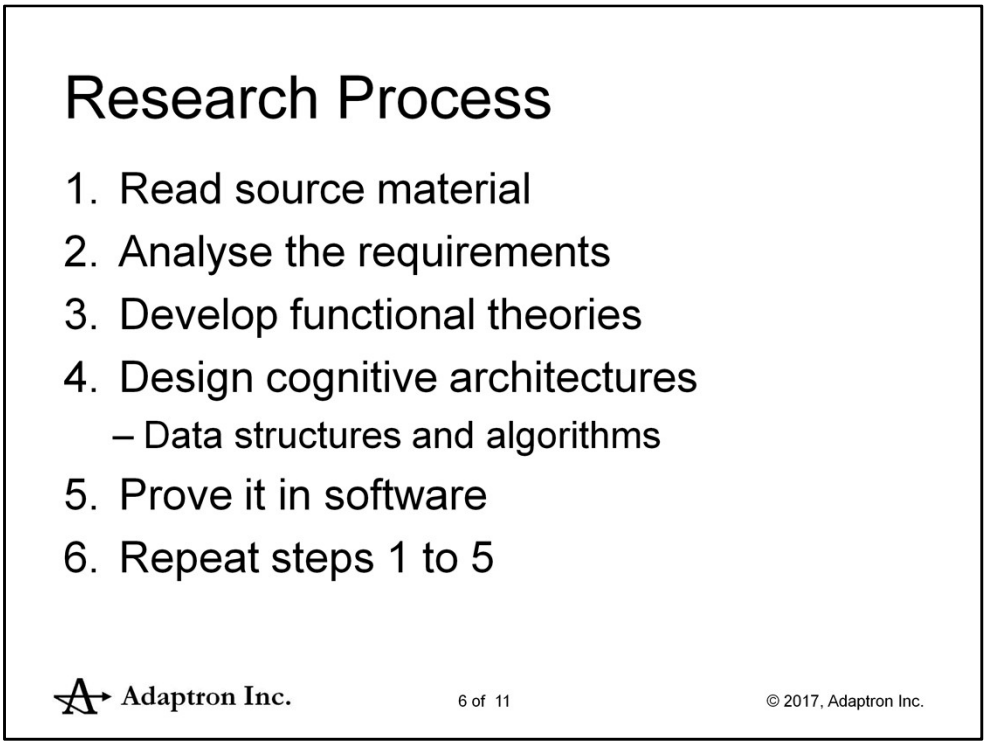
My real passion is to do research in AGI.

I started researching AGI as a hobby in 1968.

It has became more intense from 2002 onward.



These are the steps that I take to research AGI.

Since it is impossible to get models of AGI correct the 1st, 2nd or even 3rd time I repeat these steps again and again.

Some of my research has been proven in software.

Other parts of my research are still at the theory or design stages.

Reading Source Material[2] [3]

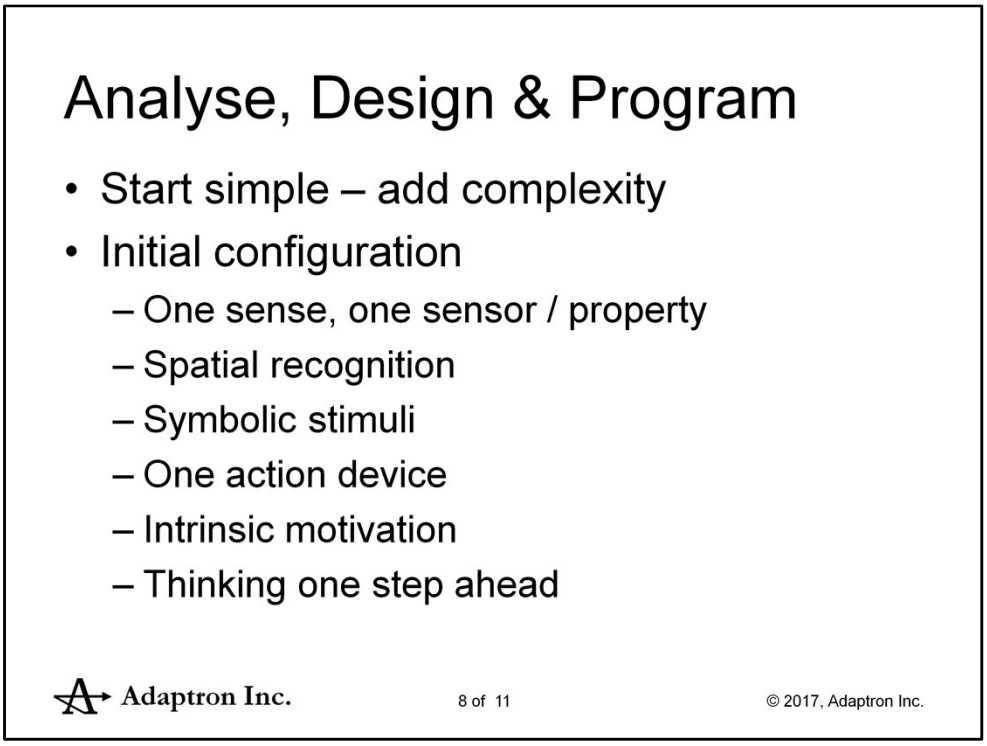
- Artificial Intelligence
  - Machine Learning
  - Reinforcement Learning
- Cognitive Science
- Neuroscience
- Psychology
- Psychophysics
- Robotics and Neurorobotics

I read papers / articles in all these areas.

I wade through the terminology and try to make sense of the ideas.

I tend to pick out those papers that contribute to a mechanistic / functional explanation of learning and thinking.

I particularly like the writings of C.R. Gallistel



I start with the simplest AGI architectures, get it working and then increase the complexity.

To be general purpose AGI software has to first work in the simplest possible configuration.

My approach is to start with the simplest situation and then add complexity.

All the time making sure it continues to work.

Testing spatial recognition is done using hand written digits.

Symbolic stimuli are ones that can be uniquely identified such as letters and words

Intrinsic motivation is the pursuit of novelty and avoidance of familiarity

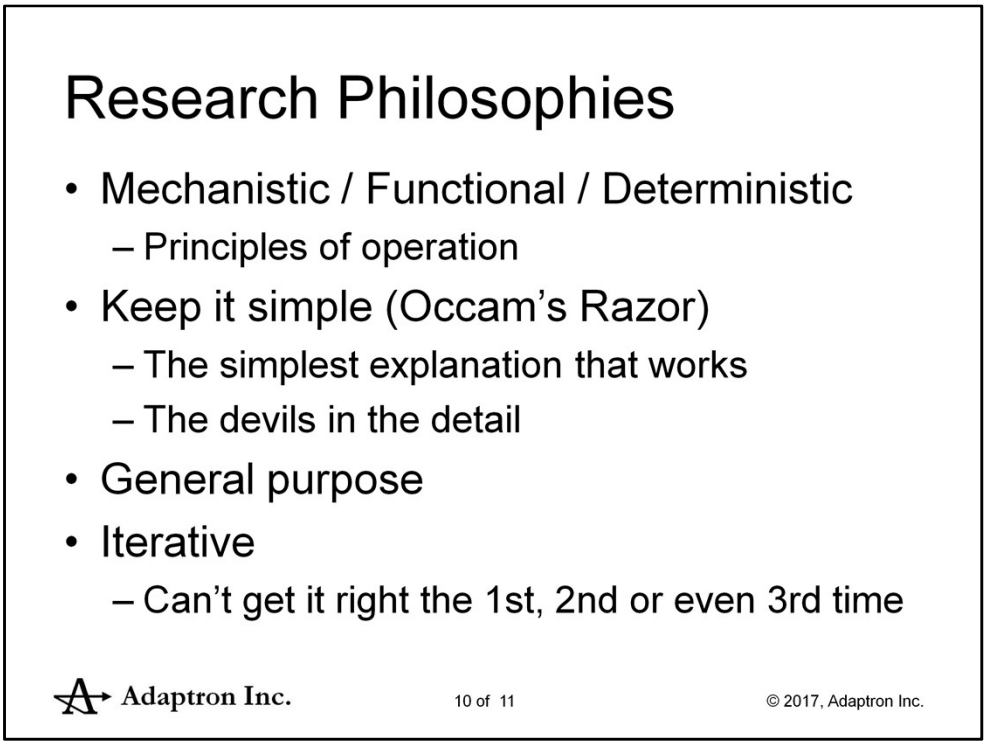
Analyse, Design & Program

- Add complexity
  - Multiple senses, multiple sensors / properties
  - Temporal recognition
  - Magnitude value stimuli
  - Multiple action devices
  - Extrinsic motivation
  - Thinking multiple steps ahead

Testing of temporal recognition is done using Morse code.

Magnitude value stimuli are ones that have an intensity that are measured with a given precision.

Extrinsic Motivation is the pursuit of pleasant stimuli and avoidance of unpleasant stimuli.



The operation of Adaptron is based on functional / mechanistic principles.

Deterministic means avoiding stochastic functions or probabilistic explanations.

This allows for models that focus on the mechanistic aspects of how it works.

And this allows for direct explanations of how it makes decisions and for developing it in software.

Another research principle is to explain things at the simple level first and then add complexity.

The problems need initially to be solved at the lowest level of detail.

Solutions must be general purpose so they can learn and think given any combination of senses and action devices.

This is research. Not everything I have discovered is correct. There are guaranteed to be mistakes and things that are wrong.

The processes of general purpose learning and thinking are too complicated to get right the first, second or even third time.

So one keeps on reading, theorizing, and experimenting.

References

[1] Martensen, B. N. (2013). Perceptra: A New Approach to Pattern Classification Using a Growing Network of Binary Neurons (Binons). In R. West & T. Stewart (eds.), Proceedings of the 12th International Conference on Cognitive Modeling, Ottawa: Carleton University.

[2] Gallistel, C.R. (1980). The Organization of Action: A new synthesis, Lawrence Erlbaum Associates, Publishers, Hillsdale, New Jersey.

[3] Gallistel, C. R. (1993). The Organization of Learning [book]. Cambridge, Massachusetts: MIT Press

Gallistel is an exceptional author. His writing is clear and easy to understand.