

The Turing Shroud

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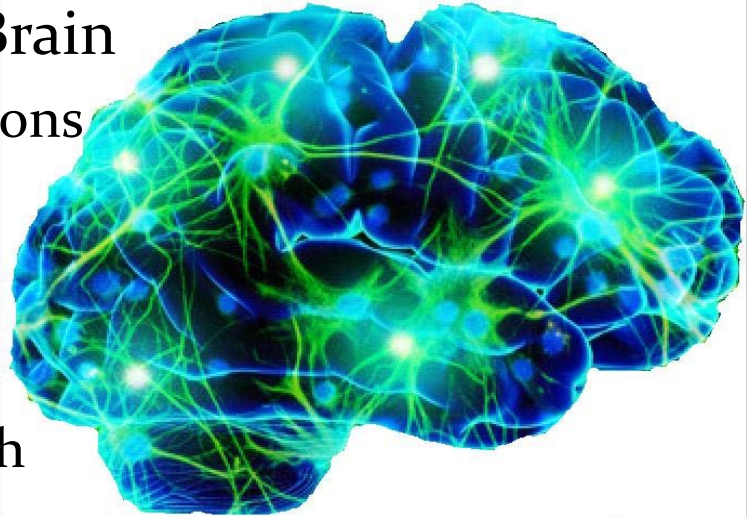
Overview

- The Vision
- Some Knowledge Challenges
- Existing Work
- The Science Fiction Prototype
- Knowledge Challenges revisited
- Reverse Engineering the Future

Individual Intelligence: Knowledge is Connection

- The Individual Brain

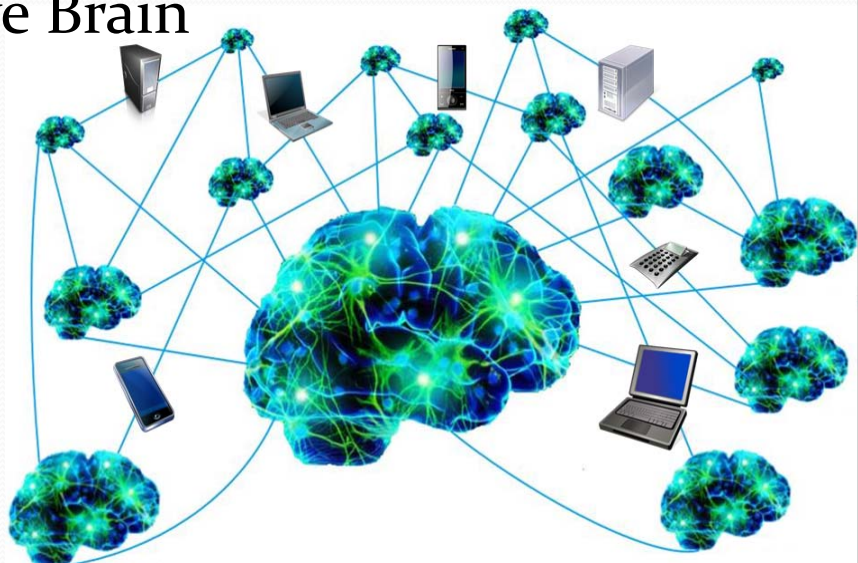
- 100 billion neurons
- 1000-10,000 connections from each
- 1 million new connections each second



The Vision: Collective Intelligence

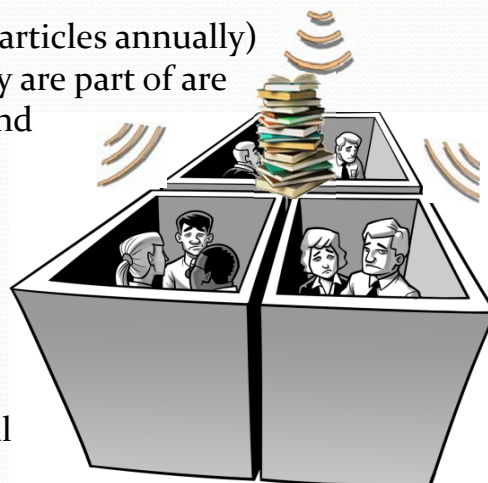
- The Collective Brain

- Prolific/
Diverse
- Selective
- Dynamic
- Human –
Machine
(with inputs
and outputs)



Some Knowledge Challenges

- The development of technology (particularly ICT - e.g., “the singularity”), holds out limitless possibilities for connectivity and the growth of knowledge
- **BUT!** The knowledge explosion (2 million+ refereed articles annually) means that researchers and the disciplines they are part of are increasingly specialised and organisationally and culturally siloed
- Knowledge is doubling every 18 months (*American Society of Training & Documentation*)
“Disciplines are products of a bygone age” (*Allen Repko - University of Texas*)
- Key enablers of the information age (e.g., The Internet and the Web) have a worsening “signal to noise ratio”



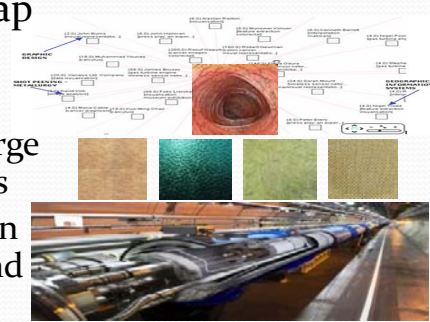
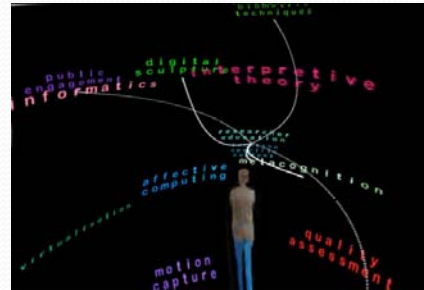
Virtual Environments for Collaborative Learning

- Different student groups have different experiences relating to a Sudanese dam project in an easy-to-learn virtual world environment
- Each group have to create a slide and present their case in a virtual meeting room in the City of London
- The group discusses the project and students have to assess the different arguments and decide on their position
- The model can be applied to many learning requirements and scenarios



Immersive Collective Thinking Spaces - with Knowledge Tools

- 3-D immersive space for real time knowledge visualisation, connection and interaction (physical & online)
 - Collaborative filtering and linking by users. System analyses words and ideas from the discussion and information about participants. Uses knowledge tools as web services
- Tools and techniques to find connections, map expertise and ideas, identify gaps and trends and suggest new areas of research
 - Wide applicability – from small workshops to large research networks and international conferences
 - Example: Cancer research connects to research in Metallurgy, GIS, Graphic Design ... Wallpaper and the Large Hadron Collider



Immersive Environments for Interactive Experiences

- 3-D Immersive installation in a museum
 - Users interact with avatars
 - People in the physical world can appear in the virtual world (and vice-versa)
 - Can be used for performance (Stelarc)
- Prototype for the 2012 Cultural Olympiad
 - Exists in both physical and virtual space (and combinations of these)
 - Living Studio/Lab which mixes live physical and virtual events and streaming
 - The environment includes a live Google Map, immersive displays, word clouds, social network and mobile interfaces etc.



Relevant Emerging Technologies



Sensory and Brain Interfacing (including nano-tech devices)



Neuron Level Brain Analysis (Human Brain Project/ US – BRAIN Initiative etc.)



Emotionally responsive interactive scenarios (e.g., Brain controlled soap operas, Affective computing)



Open World Game Environments (e.g., Skyrim, GTA, Minecraft)



Turing Shroud SF Prototype – Key Elements

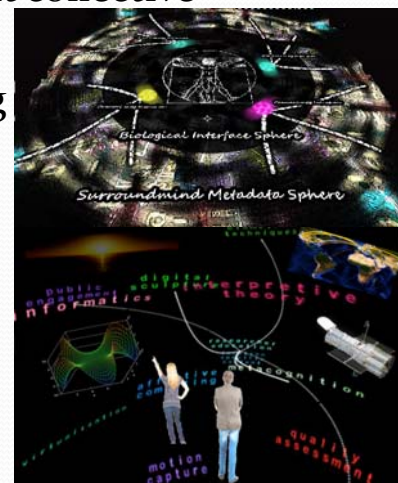
- Scenario: Attempt to get into the mind of Alan Turing, using recently discovered cryptic information, supposedly created by him
- Setting: Towards end of 21st Century
 - “Experiences” – merging physical and virtual take place in mental states varying from being awake to various dreamlike ones (lucid etc.)
 - Advanced sensory and direct brain interfaces make possible collective thinking, feeling and emotional experiences – translation of experience
 - Combined human - machine intelligence and sensory experience
 - Learning, Working, Research and Life part of a continuum
 - Learning increasingly encompasses phenomenological (subjective – “what it feels like”) as well as objective experience
 - The Science/Art (and disciplinary) divides are increasingly undefined

Some Key Challenges

- Existing challenges (Volume, Rate of Change, Noise) will be many orders of magnitude greater
- Merging of the physical and virtual will create new types of sense experience and “reality”. What effects & possibilities will this have?
- What will learning mean?
 - Currently debates take place about how calculators, the internet etc. affect what we need to learn. What will be the equivalent then?
- Intellectual property etc. and identity itself will need to be completely different (Transhumanism etc.)
 - Who will “I” be? Will the Turing Test be meaningful?!
- The positive capabilities of the new technologies will be vast – but so will the negative possibilities. How will they be regulated?

Bridges to the Future – Surround Mind

- Motivating Question: How can the internal mental and sensual configurations of individuals be reflected and externalised in a group environment to investigate and exploit collective intelligence, perception and consciousness?
- Theoretical and Practical – e.g., for Learning
- Multi-sensory, Immersive and Experiential
 - Multimedia, Covering all the senses, Direct brain interfacing as it develops
 - Exploring interaction and integration (Between senses, Inter/Intra – Human/Machine)
 - Pervasive and ubiquitous (Not a single system)
- Toolkit and Interoperable test-beds



Bridges to the Future – A New Science/Art of Knowledge

- New integrated collective experiences will need new holistic ways of thinking, experiencing and understanding
- Common and unifying elements of all disciplines and practices
- How to create knowledge (from data, information, other knowledge)
 - Eliciting from humans, Tacit knowledge, Knowledge processing
- How to represent, structure and connect it
 - Semantic connectivity, Selection and organisation (the Challenges)
- How to use it (making available, sharing, learning, find/search etc.)
 - Systems, Networks and Communities
 - Embedded knowledge, seamlessly integrated between these
 - New types of social network (learning, research, the public, business, machines etc.)

A Science/Art of Knowledge – Learning Aspects

- How and why to think – not what
- Dynamic Learning (like Just-in-Time learning)
 - Knowledge techniques used to connect and structure
 - Learning ontologies with User models
- Human - Computer co-learning
- Individual learning defined in terms of the collective
 - How to harmonise individual and group requirements
 - Personalisation and adaptive learning
- Linking learning to research, work ... life
 - Motivation, the games paradigm etc. (the emotional dimension)
- Science Fiction Prototypes (merging with real/simulated prototypes) as key development methodology

Questions, Comments & Discussion (+ Connect and Collaborate!)

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Thank You!

(Image Acknowledgement: Bellehumeur and Associates)

Collective Thinking Space - Video

