



The joy of being part of TEDxBarcelona Science 2012.

A personal view from Slavica Ilieska

If you are fortunate enough this is one place where you can find seven speakers that are able to extraordinarily stimulate your brain in 18 minutes or less. You will find the things you always loved at TED, simplicity and enthusiasm. Beware that these PhDs' and scientists' present neuroscience in front of audience which ranges from students in social sciences (like me) with no previous knowledge to scientists with similar specialization, and manage to keep them all interested, involved and open-mouthed.

First in line, **Michael Hausser** (Professor of Neuroscience at University College London), shows you pictures how by using certain GFIC techniques in experiments on rats they managed to see the movement of neurons as lights. Furthermore, what they are working on, cracking the neural code means ability to:

- › Manipulate movements,
- › Create sensations,
- › Sway decisions,
- › Restore vision,
- › (most importantly) Treat diseases.

Here comes in **Cedric Notredame** (Senior group leader at the Comparative Bioinformatics Group at the Centre for Genomic Regulation) who breaks the ice by introducing himself with mentioning the similarity of his surname with Nostradamus, which makes it even more challenging for him to make only serious predictions. Then he explains some of the most advanced traits you can come across of, for example tests for genetic variations for just 299\$, which at the end provide you with useless information. He raises two important questions:

- › Longitudinal Recordings – experiment on rats, following weight measurements long before the animal is overweight, which in long term mean ability to: diagnose disease, monitor disease, validate new medicine, monitor the treatments, and adapt the environment.
- › Personal liberties – the 'Big Brother' question accompanying every technological novelty, how to balance between saving lives and threatening personal liberties.

Third presenter - **Luis M. Martinez** (head of the Laboratory of Visual Neuroscience at the Institute of Neuroscience in Alicante) tells us something we didn't expect – vision has nothing to do with pictures?! Then he specifies that our brain has three problems:

Problem nr.1: The brain doesn't have touch with reality

Solution: we create catalogue in our brain which connects images with reality

Problem nr.2: The brain is too 'expensive' (metabolically)

Solution: it makes its own strategies to save energy (visual solution, adaptation, brightness/contrast...)

Problem nr.3: The brain is too slow

Solution: Seeing is a creative process (and art makes it even harder for it)

To answer our doubts – Seeing is not perception of images, is problem solving.

To give us new energy from the break comes **Andrew Holmes** (Chief at the Laboratory of Behavioural and Genomic Neuroscience). A touching story about a baby who isn't afraid of rats. As an experiment it is being exposed to a disturbing sound every time a rat comes nears him. After the experiment the baby was afraid not only of rats but of everything that was white and fluffy – from rabbit to Santa Clause. This experiment, for example, just shows why people who have been part of war fear the sound of helicopters. For conclusion, he gives us an optimistic study which states that from 100 people, around 80 suffered a big trauma in their lives, but only 8 will suffer from post-traumatic stress disorder (PTSD). His team is treating them with exposure therapy which means going back to the traumatic experience and facing it.

Fifth on the list a dreamer who is trying to teach a computer to write poems, **Pablo Gervás** (associate professor at Universidad Complutense de Madrid, where he leads a research group on Natural Interaction based on Language). Inspired by a famous saying by Richard Feynman "What I cannot create, I do not understand.". Fully aware of advantages and disadvantages of today's computers compared to our brain, he is building a computer which can imitate brain in three important aspects: grammar, logic and memory (store of poems). The result is Wishful Automatic Spanish Poet, long for WASP, which in 2010 even succeeds in writing a poem in the style of F. García Lorca. Have in mind, WASP is a published poet, in the book of Dionisio Cañas and Carlos González "Can a computer write a love poem?".

The floor remains for the last speaker **Paul Verschure** (research professor with the Catalan Institute of Advanced Studies (ICREA) and director of the Center of Autonomous Systems and Neurorobotics and the laboratory of Synthetic Perceptive, Emotive and Cognitive Systems at the Universitat Pompeu Fabra (UPF)) who gives as details about the time when he was part of an experiment with ketamine and he couldn't understand his body. He explains in details about H4W and the four questions which motivate the brain to take action: why, what, where and when. In his words: Acting means solving the H4W problem! One step further he is explaining the H5W problem with introducing parallelization and consciousness.

His assumption is that in 20 years half of the audience will be robots, but first they have to solve the H5W problem and at the same time show a level of consciousness to get involved into the society. Humanity has three main questions: universe, life and consciousness. To answer the third question he remarks: consciousness solves the H5W problem.

Conclusions given by **Mara Dierssen** (Chair Scientific Advisory Board at Fenomebiotech and Behavioural Neuroscientist-Group leader at Centre for Genomic Regulation), which only open new questions for thinking. She asks whether there is a possibility for existence of non-material soul or God? Even with the newest technologies and abilities to cure diseases we still have unsolved mysteries. For example, she mentions the Savant syndrome, people with disabilities which express unusual talents for art and music. She expresses the main theme of the conference in one sentence: Neuroscience is the new frontier in knowledge!

At the end a big round of applause for the 7 innovators which brought neuroscience closer to everyday people and looking forward to new surprises at the next TEDxBarcelona!