GOBIERNO DE ESPAÑA
MINISTERIO DE FOMENTO

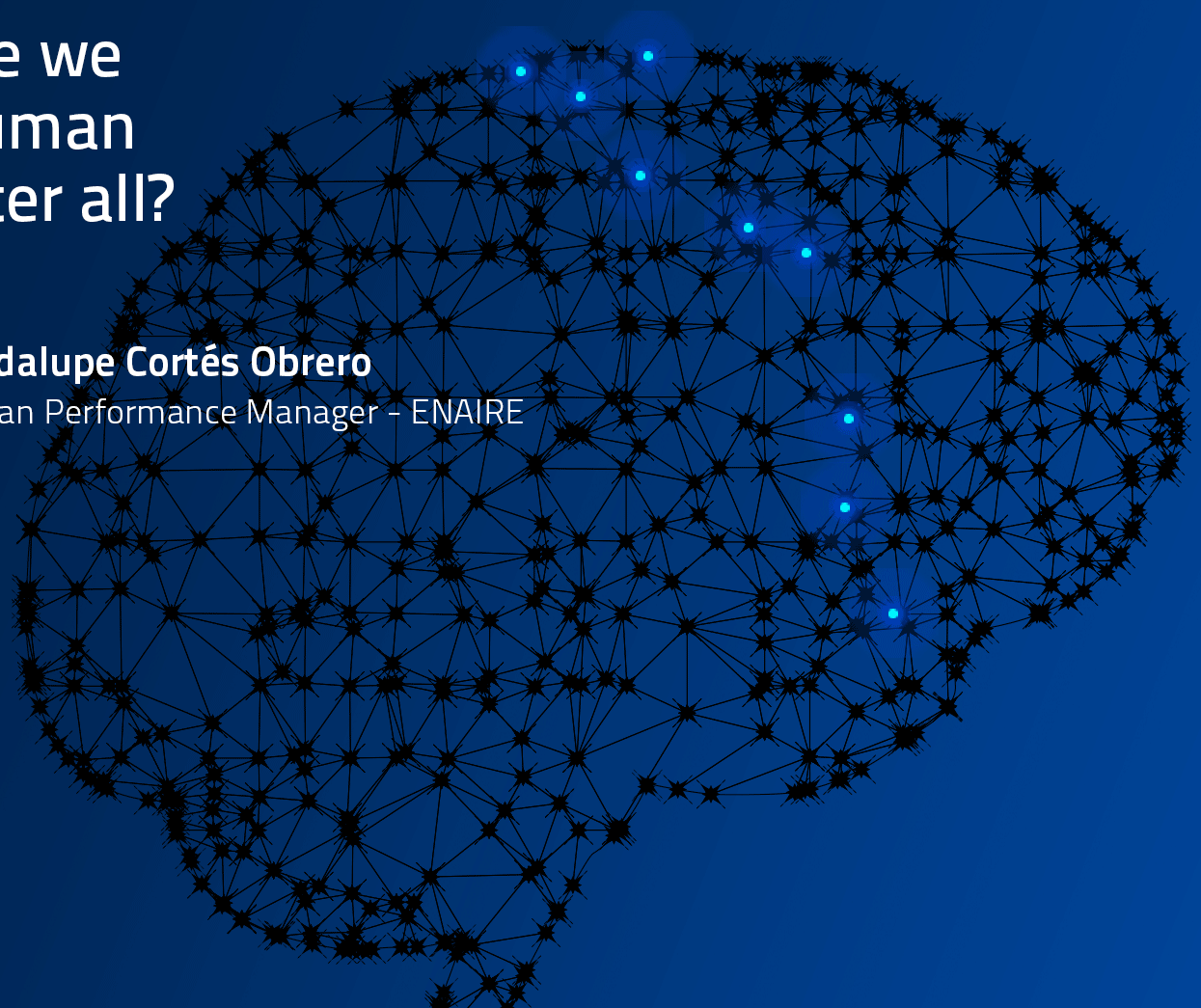
ENAIRE

EUROCONTROL

DFS Deutsche Flugsicherung

Are we Human after all?

Guadalupe Cortés Obrero
Human Performance Manager - ENAIRE



Acknowledgments:

MARTA LIGIOIZ VÁZQUEZ

Doctor, Author, Neuroscientific and Expert in emotional intelligence, coaching and education.

She inspired the contents and ideas of this presentation.

The Human brain is a natural mode of automation

CHALLENGE:

- Group of people together
- Mission: to become a TEAM
- TASKS
- 30 minutes approx.

3 questions

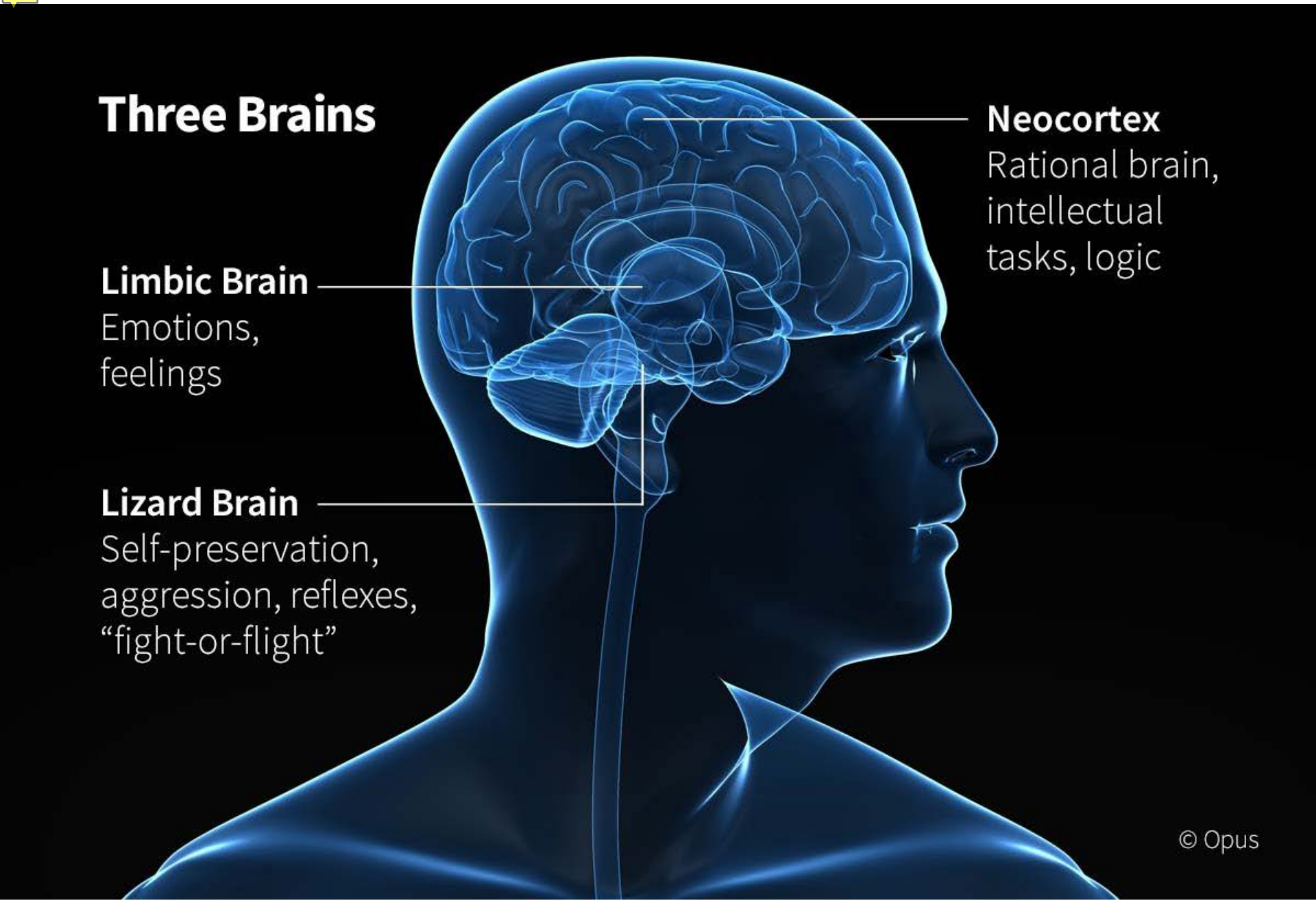
- Would you like to be part of this Mission?
- Do you think it´s possible?
- Can you contribute to it?

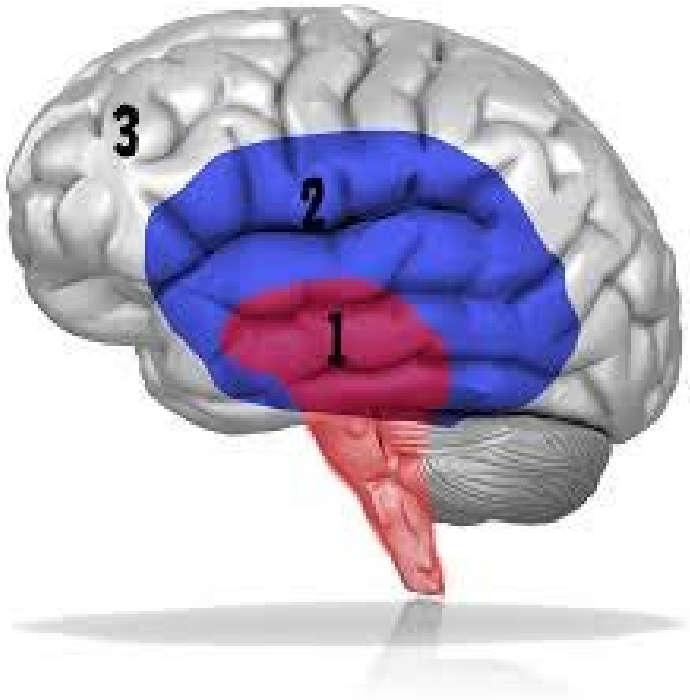
TASK#1
CLAP

The Human brain is a natural mode of automation

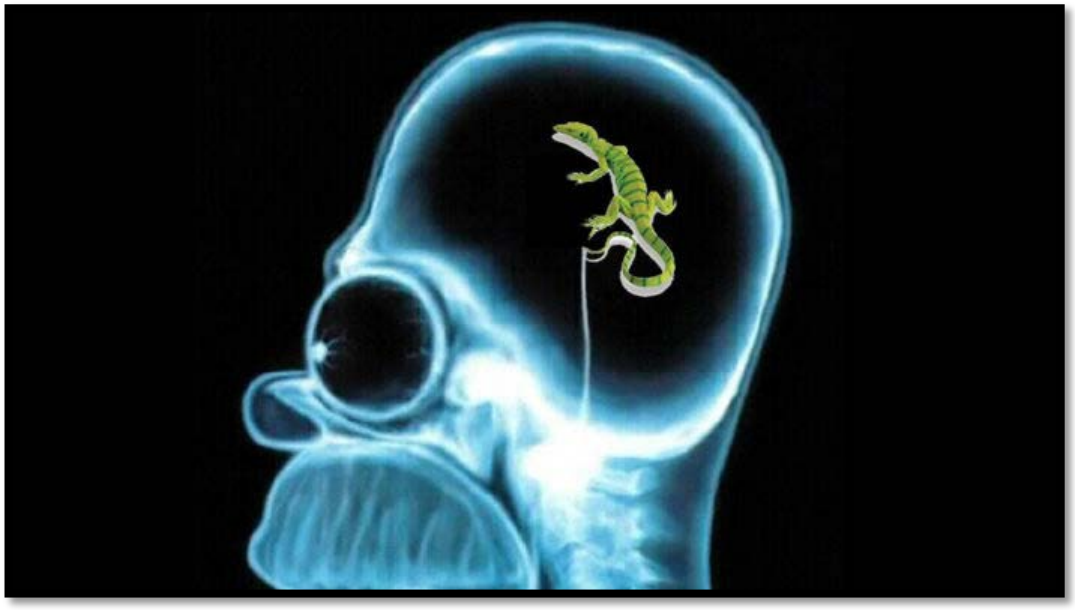
STATEMENT 1

Our brain has been formatted by millions of years of evolution

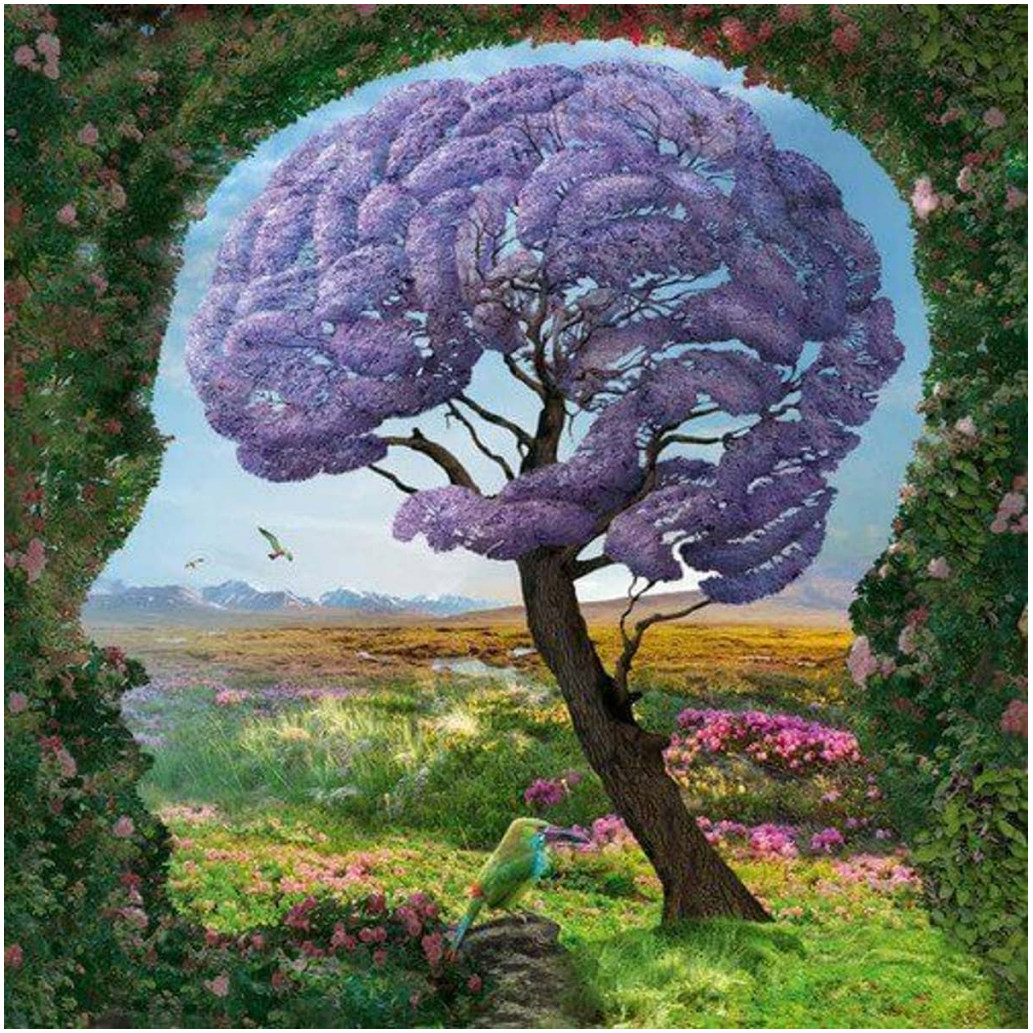

Three Brains
Neocortex
Rational brain, intellectual tasks, logic
Limbic Brain
Emotions, feelings
Lizard Brain
Self-preservation, aggression, reflexes, “fight-or-flight”
© Opus



1. Reptilian (Instinctive Brain)
2. Mammalian (Emotional Brain)
3. Human (Rational Brain)



REPTILIAN BRAIN

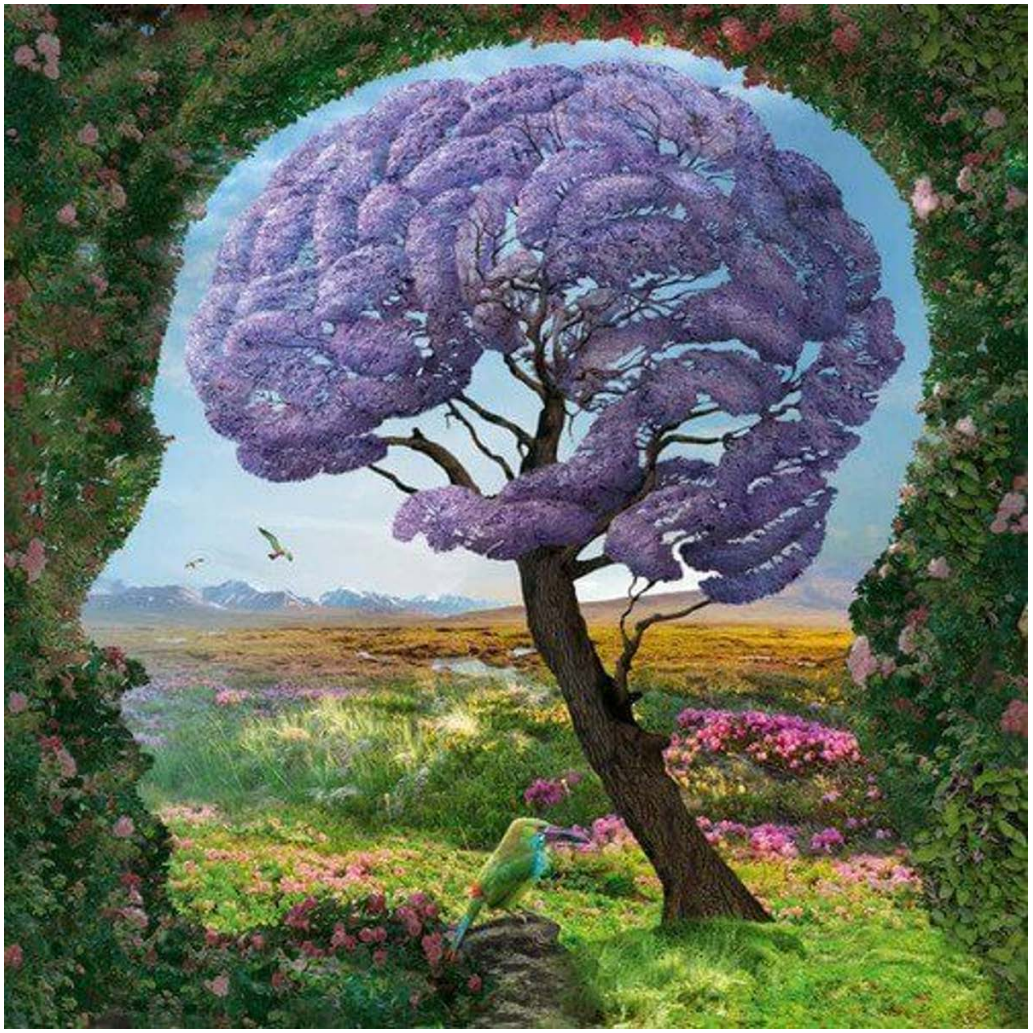


LYMBIC BRAIN

Involved with emotions, memory and connecting feelings to events.

It controls hormones and temperature.

It becomes active when emotions such as fear, anger, frustration and pity are aroused.

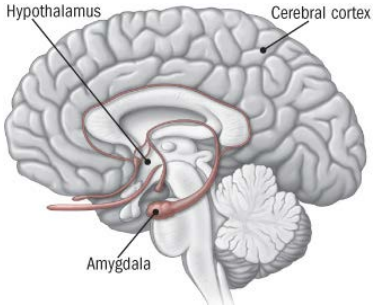


The function of emotions

- Defend and alert
- Motivation
- Greater capacity to respond, improving our survival
- ”The glue of knowledge”, they support learning
- They support our organism for effective response (chemistry of our organism)

The Amygdala

The response to short-term stress is critical for survival



- Our ”fear centre” of the brain
- Activates our central stress response System
- Regulates hormones, particularly the stress hormone cortisol
- By rapidly increasing glucose levels, speeding the heart rate, and increasing blood flow to the muscles in our arms and legs, this stress response allows us to respond to a threat.
- After the danger has passed, the system works to return hormone levels to normal.

HUMAN BRAIN – NEOCORTEX

The most “recent” brain and the most sophisticated: evaluation and logic.

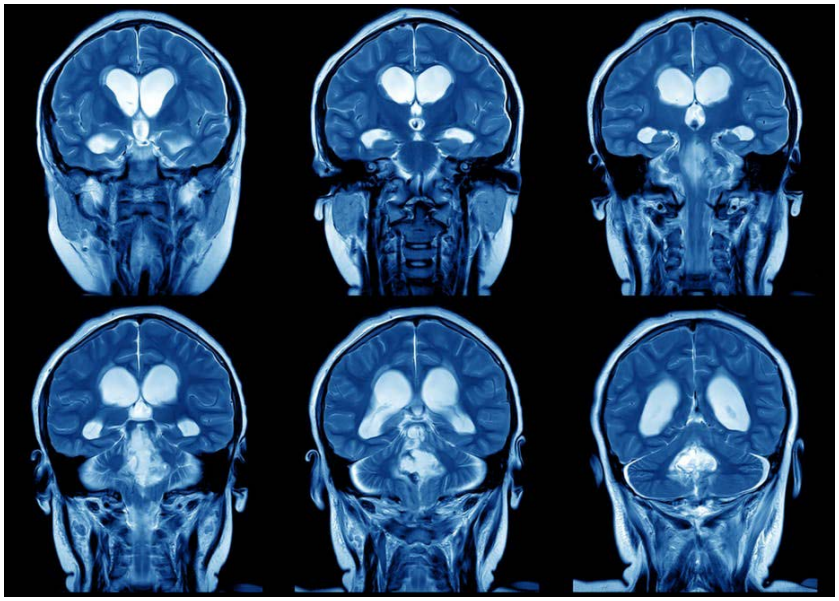
It’s role is in the **higher functions** of decision making, purposeful behaviour and in planning head our strategies for the future.

It specializes in making sense of our senses (sight, sound, touch, taste and smell) and processing the information received.

Unlike the other two brains, it operates on a mostly conscious level, and is responsible for voluntary movement.

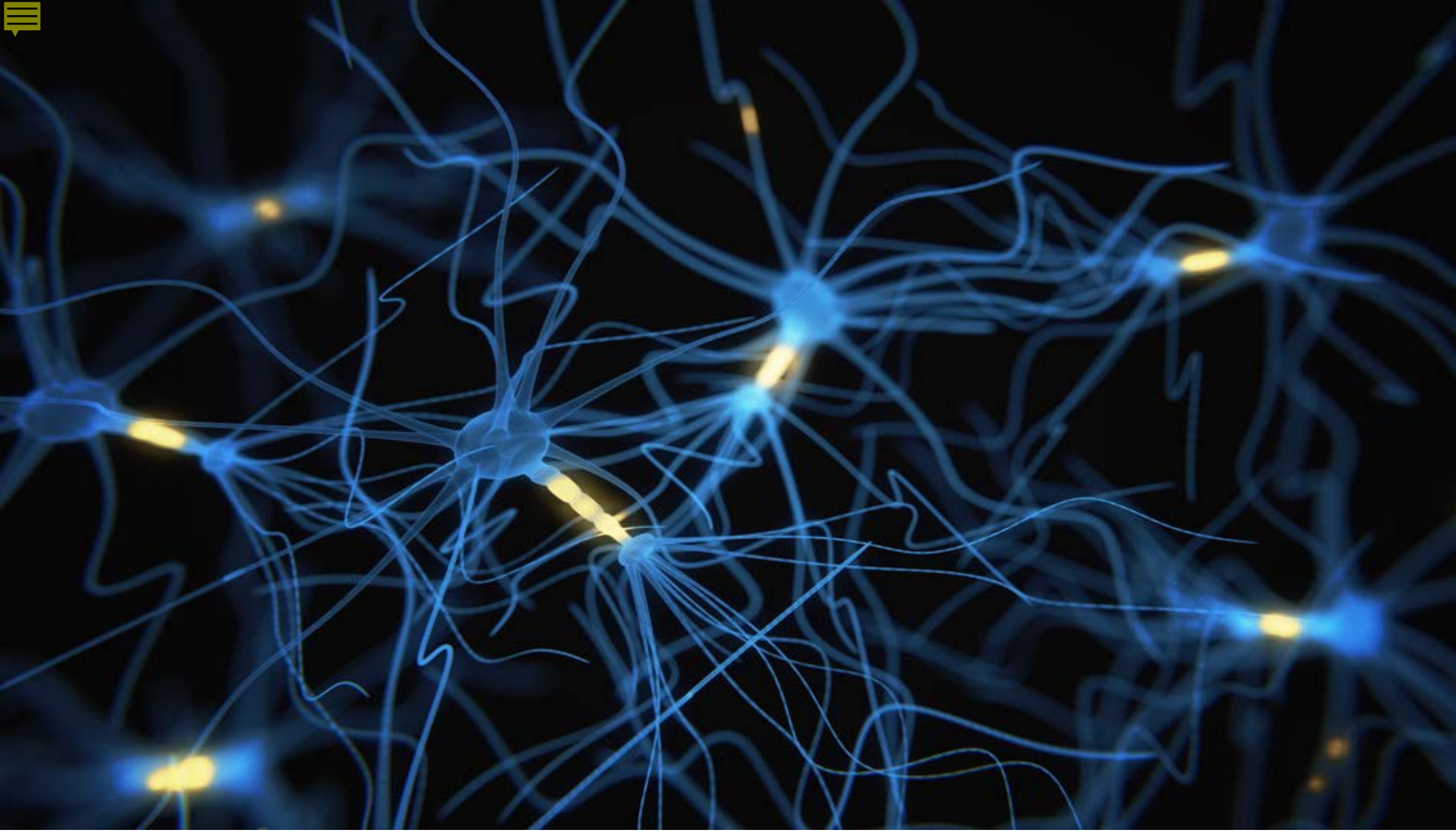
The brain controls **higher, conscious activities** such as thinking, reasoning and feeling

The brain **controls lower unconscious** physiological activities such as breath, pulse and digestion



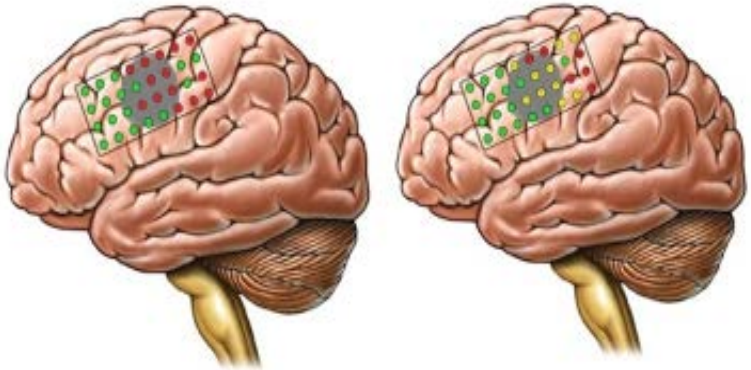
STATEMENT 2

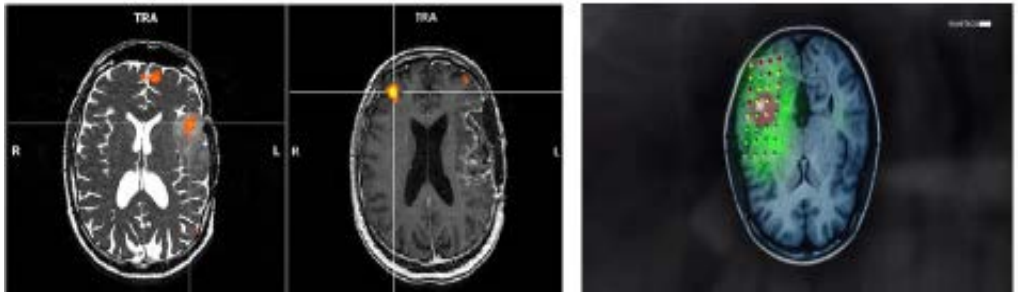
Brain plasticity is the ability of the brain to modify its connections



NEURONAL SYNAPSES

Neuroplasticity: brain´s ability to change and adapt as a result of experience





Dr. Barcia Team - San Carlos Hospital, Madrid

STATEMENT 3

There is a connection between emotions and performance

NEUROTRANSMITTERS

"The body's messengers": molecules used by the nervous system to transmit messages between neurons, or from neurons to muscles.

Neurotransmitters do not act independently, but they interact with and affect each other to maintain balance within the body.

- **Endorphins**: natural pain killer, euphoria, immune response.
- **Dopamine**: "reward system", motivation, learning, alertness.
- **Serotonin:** Mood and emotions, sleep-wake cycle, metabolism and appetite, cognition and concentration.
- **Oxytocin:** involved in childbirth and breast-feeding, but also associated with empathy, trust, and relationship-building and adaptation to social situations.

VIA EMPRESA IN ENGLISH

Cyberclick, the happiest company in the world

The online advertising and direct marketing firm tops the Great Place To Work ranking for the second year running by making a good environment its main tool for productivity

- "**Before-you-go-survey** ..."
  - ✓ In what mood did you enter work today?
  - ✓ What mood are you leaving work today?
  - ✓ From 1 to 4, how much did you enjoy what you did today?

- **Weekly meeting** where they analyse the results of their daily test of happiness (green, yellow and red feelings of the previous week).

- **Test of monthly happiness (**deeper issues such as work conciliation or relationships with peers).

El Celler de Can Roca, one of the best restaurants in the world, with 3 Michelin Stars.

Once a week they close the restaurant to promote emotional intelligence and team building

STATEMENT 4

The power of epigenetics: the study of biological mechanisms that will switch genes on and off, influencing change throughout a person´s life and even in later generations.

How epigenetics affects twins

Dr. Manel Esteller – Spanish National Cancer Center

- The largest twin study on epigenetic profiles (2005)
- 80 sets of identical twins, from 3 to 74 years old
- Environmental factors can change gene expression and susceptibility to disease
- 35% of twin pairs had significant differences in DNA
- Older twin pairs were more epigenetically different than younger twins.
- Twins who reported having spent less time together during their lives, or who had different medical histories, had the greatest epigenetic differences.

How far can we go?

At the 1968 Mexico City Olympic Games, Dick Fosbury, a 21-year-old USA athlete, introduced an innovative technique of jumping, changing the entire philosophy of the sport.

Information that collapses a pre-set idea produces **significant changes.**

Dick Fosbury – A man that changed the High Jump forever

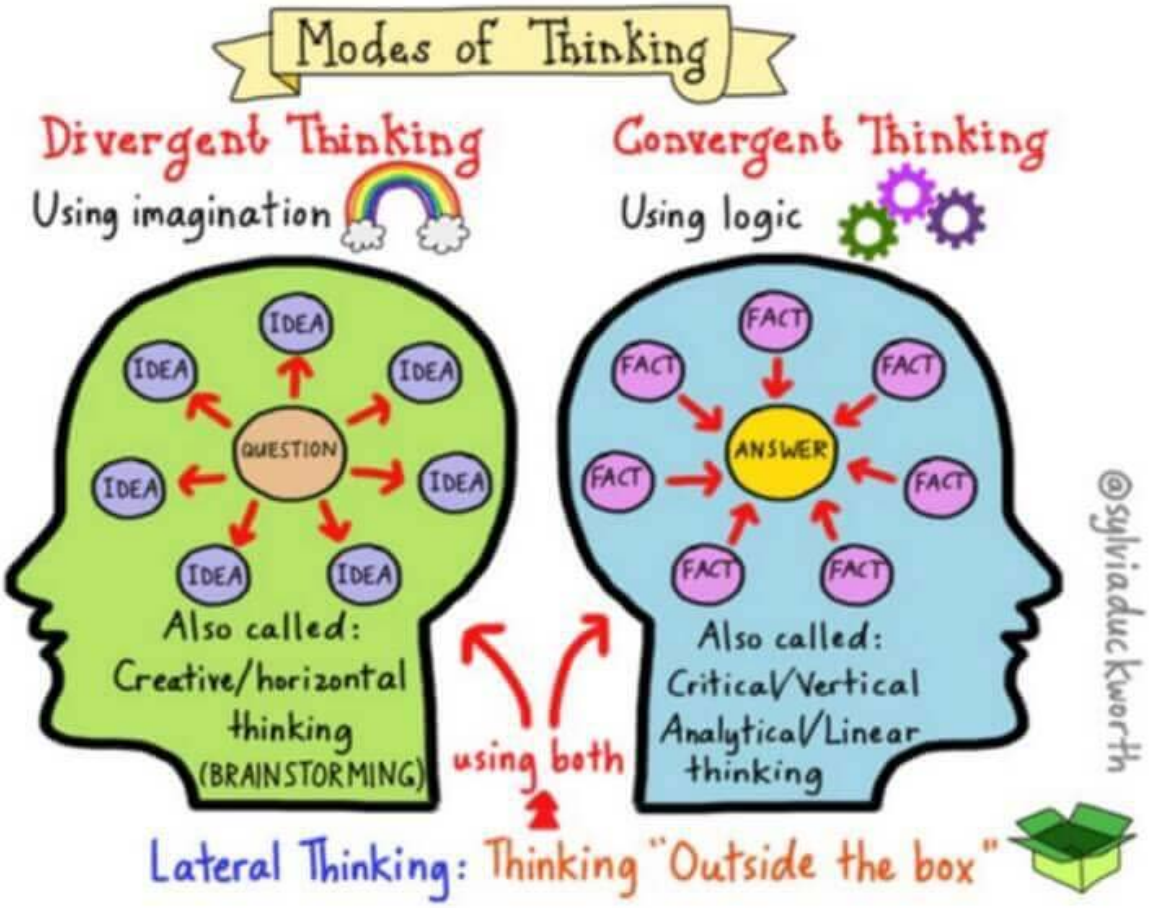
The evolution revolution

When we change personal circuits we not only do it in ourselves, but it affects our surroundings, our collective circuits.

Johanna Quaas
A 90-year-old gymnast

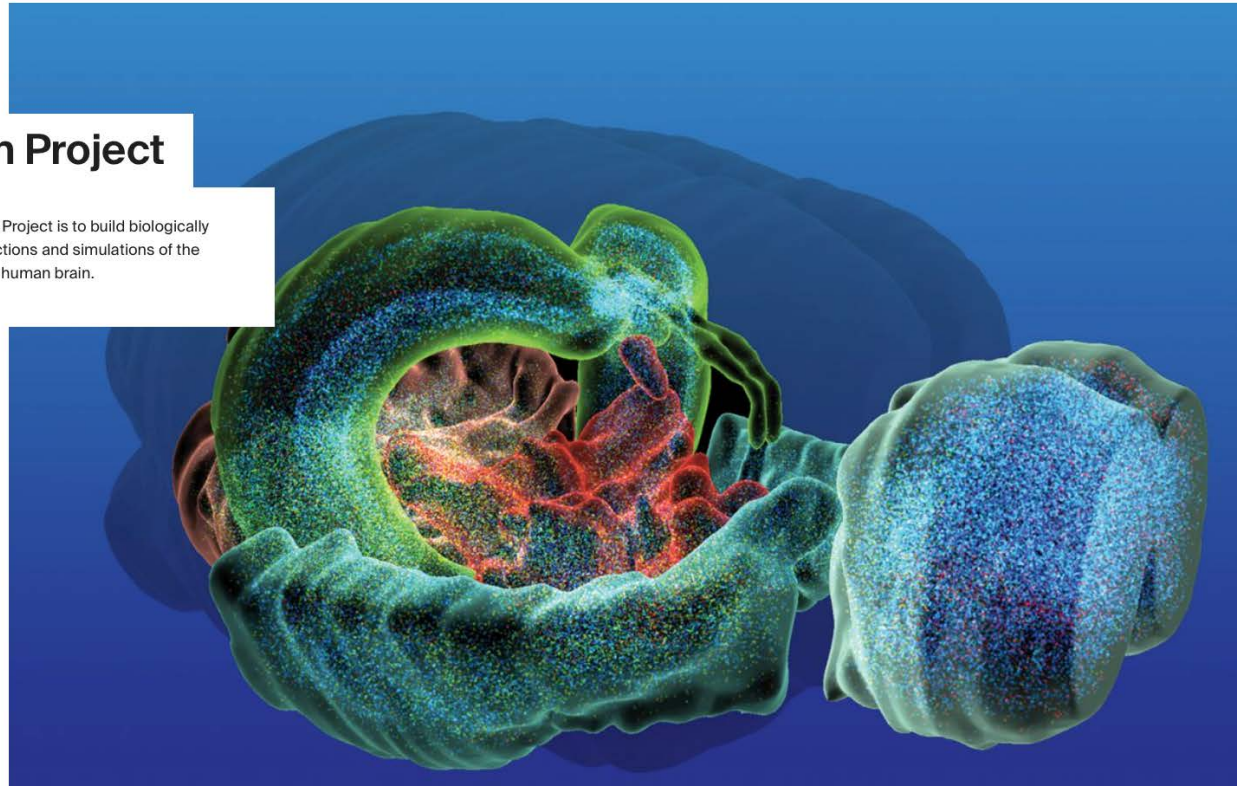
Wang Deshun (80 years old)
at his debut as a model

TASK#2
Draw


Modes of Thinking
Divergent Thinking
Using imagination
Convergent Thinking
Using logic
IDEA
QUESTION
Also called:
Creative/horizontal thinking
(BRAINSTORMING)
FACT
ANSWER
Also called:
Critical/Vertical
Analytical/Linear thinking
using both
Lateral Thinking: Thinking "Outside the box"
@sylviaduckworth

STATEMENT 5

Automation: the future is here

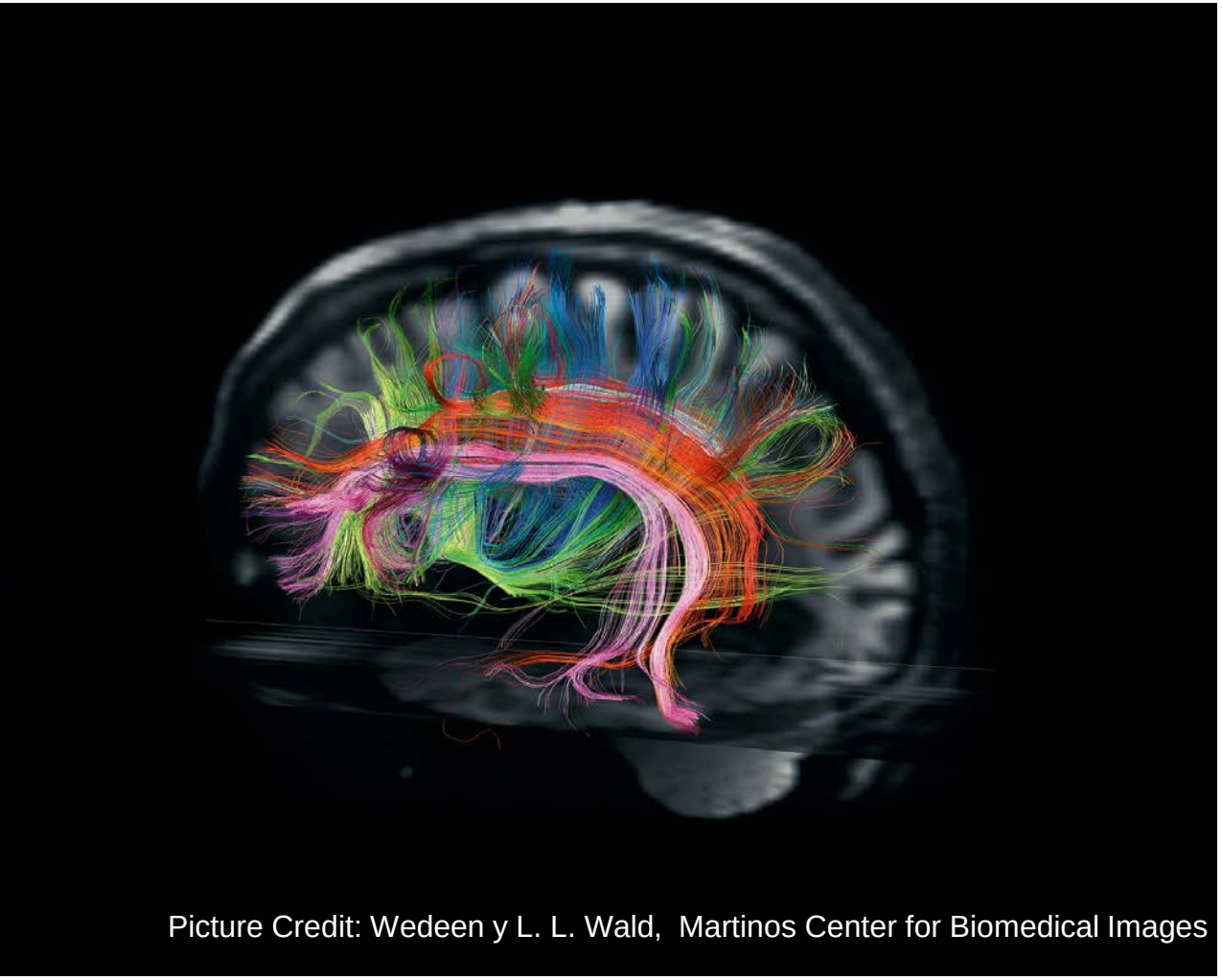


Why is this important?

Understanding the brain is vital, to understand the biological mechanisms which give us our thoughts and emotions and which make us human.

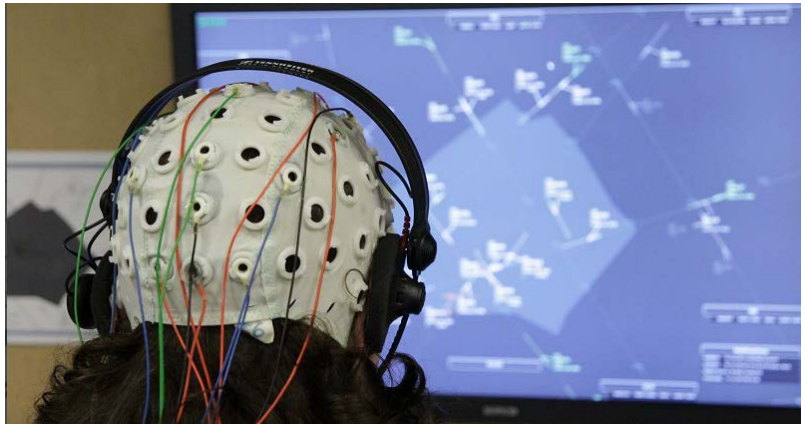
Understanding how the brain processes information can make a fundamental contribution to the development of new computing technology – neurorobotics and neuromorphic computing.

https://www.epfl.ch/research/domains/bluebrain/



Picture Credit: Wedeen y L. L. Wald, Martinos Center for Biomedical Images

THE COLOUR OF THOUGHT



nina
NEUROMETRICS INDICATORS FOR ATM

deepblue

NINA is a **research project** co-funded by SESAR, as part of its long term research programme.

It aimed at developing **a tool able to perform a real time assessment on a set of cognitive states** of Air Traffic Controllers performing their job – such as mental workload intensity, type of attentional control and proficiency level gained during a training period. The tool uses an algorithm based on the analysis of 3 main neurophysiologic indexes: electrical brain activity, heart rate variability, eye blinking.

Source: www.dblue.it

STRESS

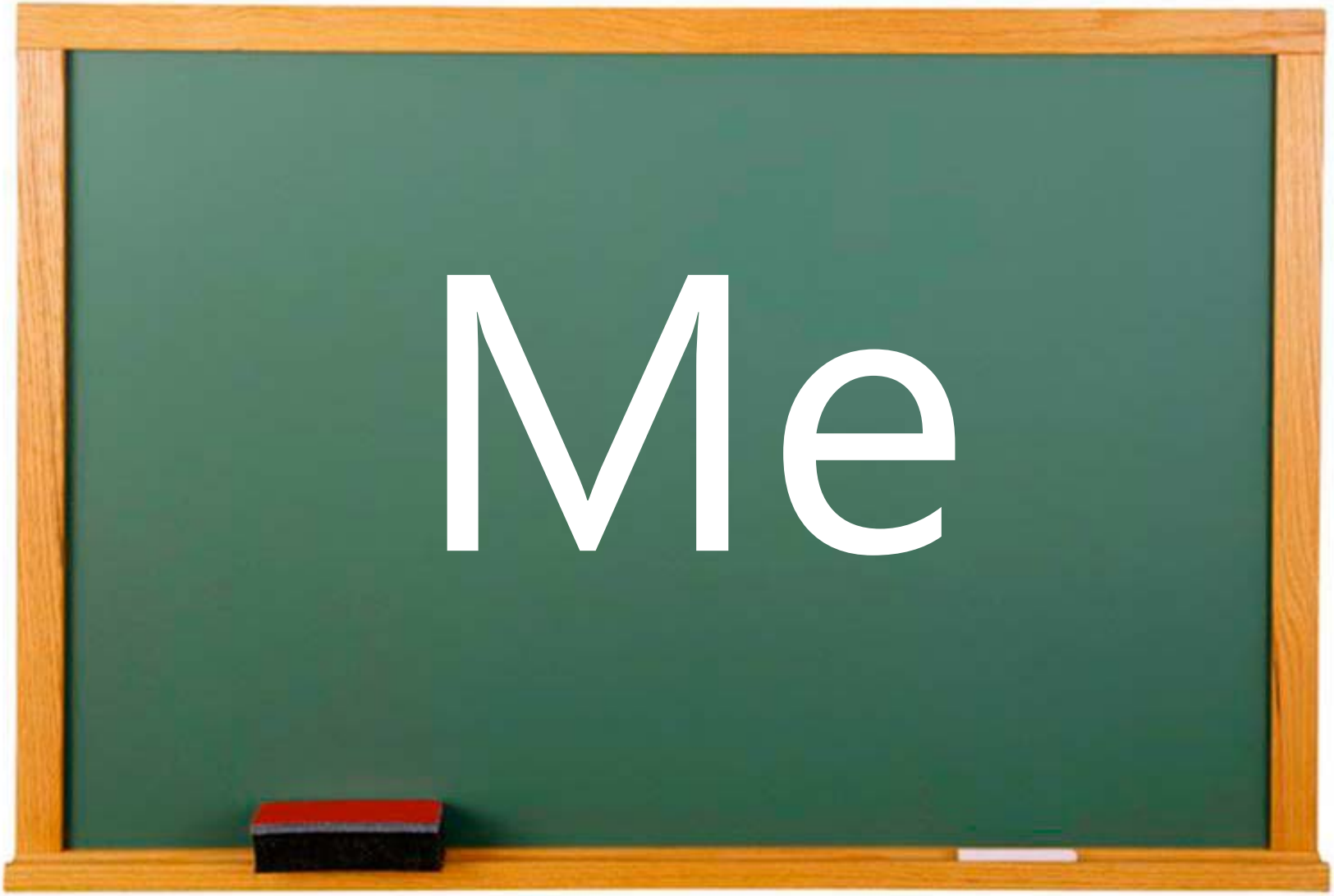
HUMAN PERFORMANCE NEUROMETRICS
TOOLBOX FOR HIGHLY AUTOMATED SYSTEMS DESIGN

The main goal of the project is to generate knowledge able to support the design of the technologies which will be used by controllers to manage the future air traffic scenario.

TASK#3
PEOPLE CREATE SAFETY

TASK#4
RAIN

The Unicorn Project Foundation


Me


We

Image Credit: Shutterstock/Agsandrew

gcobrero@enaire.es

+ 34 670696270

Thanks

Skype: gcortesobrero

https://es.linkedin.com/in/guadalupe-cortés-19616558