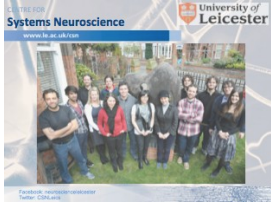


Neurociencia de Sistemas

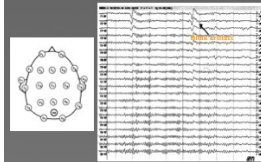
- Clase 1. Introducción
- Clase 2. Registros extracelulares y Spike sorting.
- Clase 3. Procesado de información visual.
- Clase 4. Percepción y memoria.
- Clase 5. Decodificación - Teoría de la Información.
- Clase 6. Electroencefalografía - Análisis de tiempo-frecuencia y Wavelets.
- Clase 7. Potenciales evocados - Análisis de ensayo único.
- Clase 8. Dinámicas no-lineal - Sincronización.

Slides

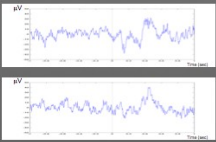
<https://www.df.uba.ar/ea/academica/programa-de-profesores-y-egitantes>



Scalp EEG



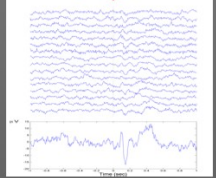
Evoked potentials



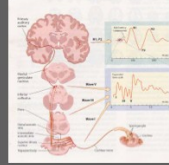
Classification of Evoked Potentials

- Sensory
 - Auditory
 - Visual
 - Somatosensory
- Cognitive

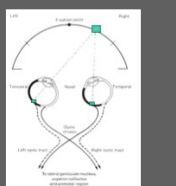
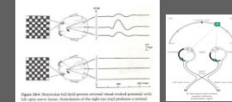
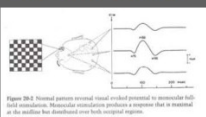
Averaged evoked potentials



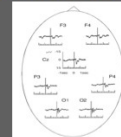
Auditory Evoked Potentials



Visual evoked potentials



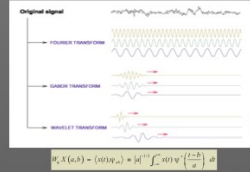
Pattern visual evoked potential



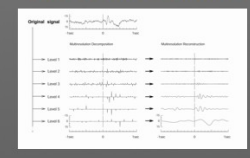
Oddball paradigm



Wavelets



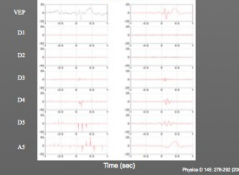
Multiresolution decomposition



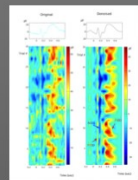
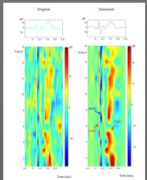
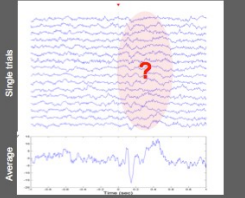
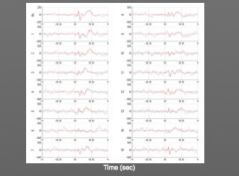
Average evoked potentials

- Increase signal to noise ratio, but:
 - Assume background EEG is noise
 - Assume all evoked responses are similar (i.e. there are no changes from trial to trial).
 - Miss information about single trial variations

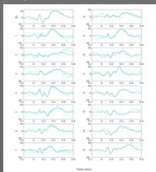
Denoising



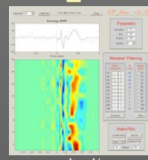
Denoising of single-trials

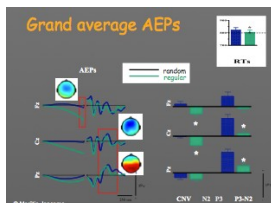
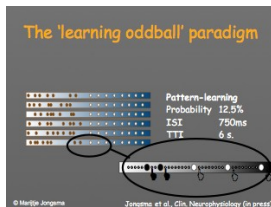
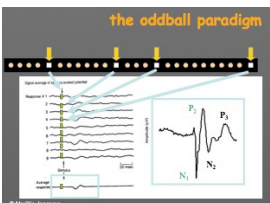
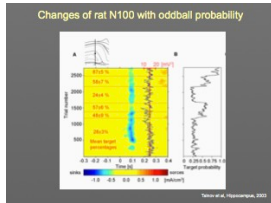
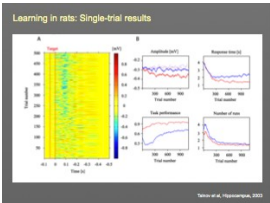
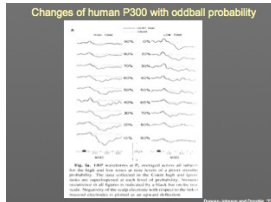
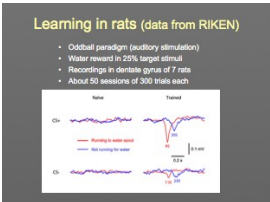
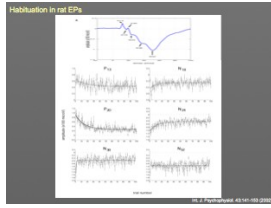
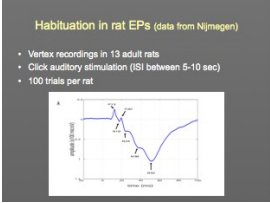


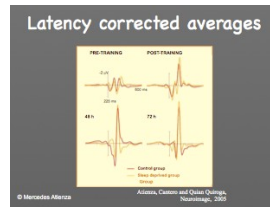
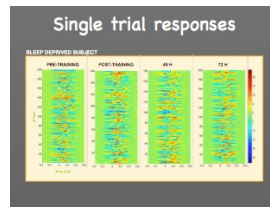
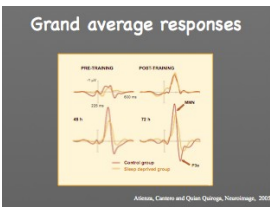
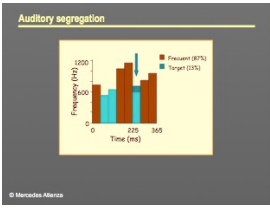
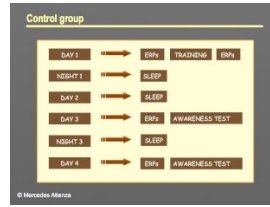
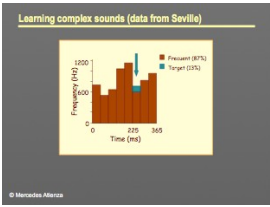
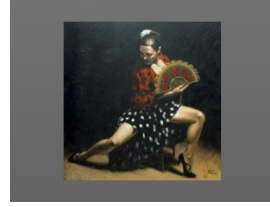
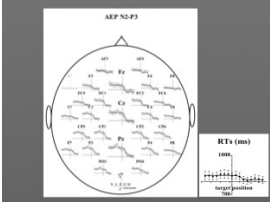
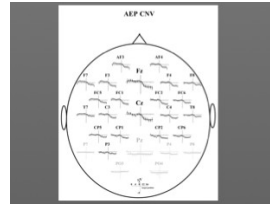
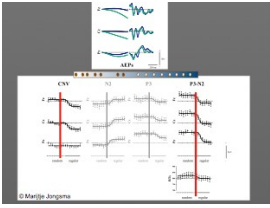
Another example...

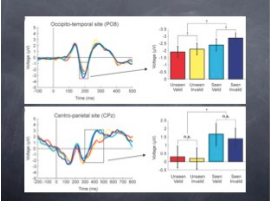
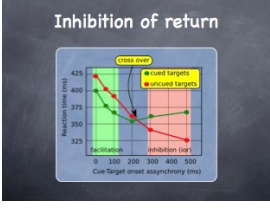
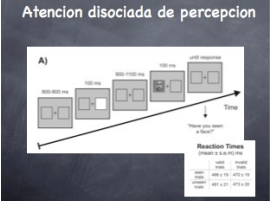
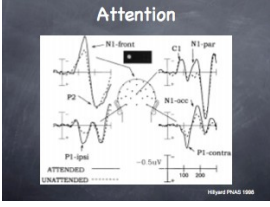
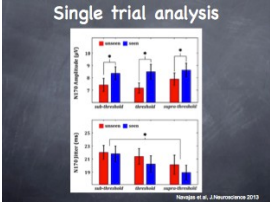
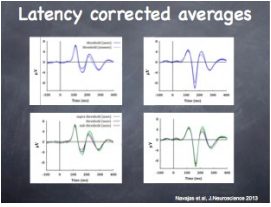
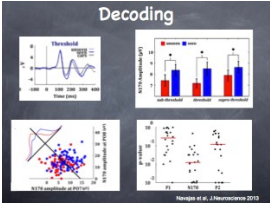
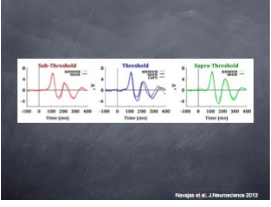
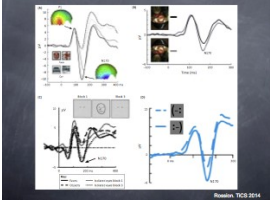
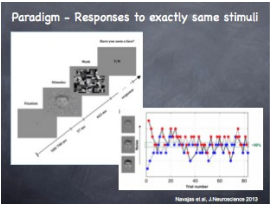
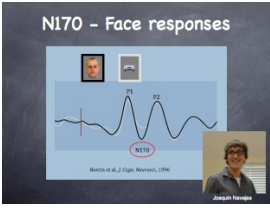


EP_den









Decoding


Decoding method	POB	POB
Decoding: search & selection	98.7(8.0), 2(1.0)*	97.7(8.0), 2(1.0)*
Decoding: search	98.7(8.0), 2(1.0)*	98.7(8.0), 2(1.0)*
Decoding: search for activation	98.8(8.0), 2(1.0)*	98.8(8.0), 2(1.0)*
Decoding: search for activation	98.8(8.0), 2(1.0)*	98.8(8.0), 2(1.0)*
Decoding: search for activation	98.8(8.0), 2(1.0)*	98.8(8.0), 2(1.0)*
Decoding: search for activation	98.8(8.0), 2(1.0)*	98.8(8.0), 2(1.0)*
Decoding: search for activation	98.8(8.0), 2(1.0)*	98.8(8.0), 2(1.0)*

Table 3. Reaction Times for Search and Category (Mean \pm SD in ms)

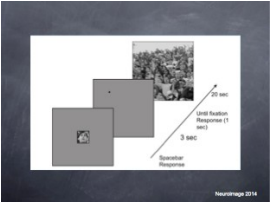
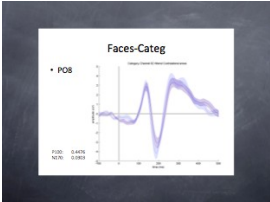
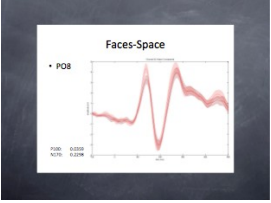
	Search	Category
Hit trials	383.4 \pm 13.7	383.3 \pm 13.7
False trials	464.4 \pm 23.2	387.4 \pm 16.7

Bloque 1: Donde se presento el estímulo?
Bloque 2: Era cara o auto?


Correlatos neuronales de distintos tipos de atencion



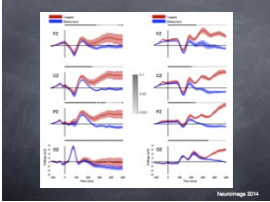
Manuel Paricio



Natural perception...



Leitch Kaelin
Maria Ben



Clase 7. Potenciales evocados - Análisis de ensayo único

Evoked potentials.
Clase 7. Potenciales evocados - Análisis de ensayo único. In: Encyclopedia of Medical Devices and Implementation. John G. Webster, ed. J. Wiley, John Wiley & Sons, Inc, 2006.

Single-trial evoked potentials with Wavelet Denoising.
Clase 7. Potenciales evocados - Análisis de ensayo único. In: IEEE Transactions on Biomedical Engineering. 51, 2004, pp. 115-120.

Single-trial analysis of ERG amplitudes to transient, blinding and steady-state stimuli.
Clase 7. Potenciales evocados - Análisis de ensayo único. In: IEEE Transactions on Biomedical Engineering. 51, 2004, pp. 115-120.

What can we learn from single-trial evoked potentials?
Clase 7. Potenciales evocados - Análisis de ensayo único. In: IEEE Transactions on Biomedical Engineering. 51, 2004, pp. 115-120.

Integrating Brain Function With EEG: Advanced Temporal and Spatial Analysis of Electroencephalographic Signals.
Clase 7. Potenciales evocados - Análisis de ensayo único. In: Springer, 2013.

Hoddermeyer and Lopes de Silva. Electroencephalography.