



APEREST

Approximately Periodic Representation of Stimuli

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- Swiss Federal Institute of Technology Lausanne (EPFL)
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APEREST Overview

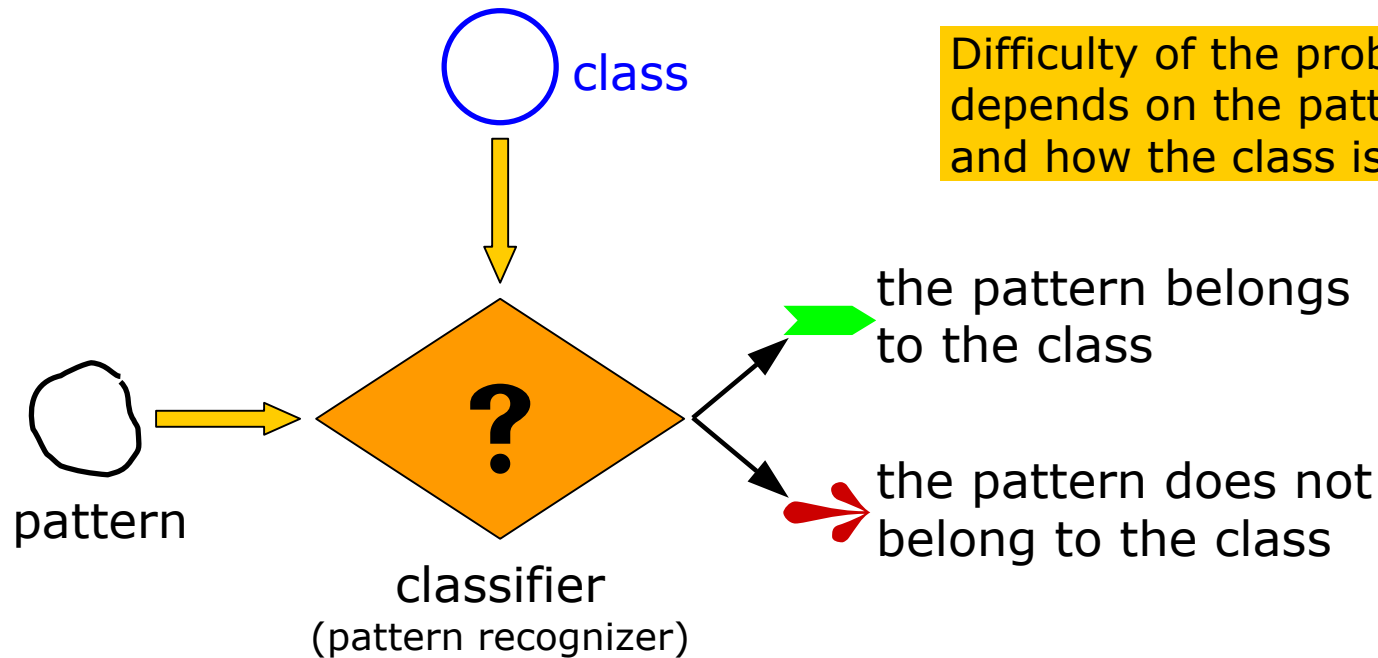
- What APEREST is about?
 - Knowledge Representation & Recognition
 - Equilibrium vs. Periodic -based
 - chaos-based representation of diversity
 - synchronization-based pattern matching
- Objectives
 - engineering of a bio-inspired **periodic KRS**
 - microscopic verification (neuronal)
 - macroscopic verification (EEG)
- APEREST Workplan
 - three WPs to achieve these objectives





The Classification Problem

The IT Problem - Knowledge Representation and Recognition



Difficulty of the problem depends on the pattern class and how the class is defined

Main problem is **DIVERSITY**

- from the stereotype to the class
 - how to represent it
 - how to deal with it





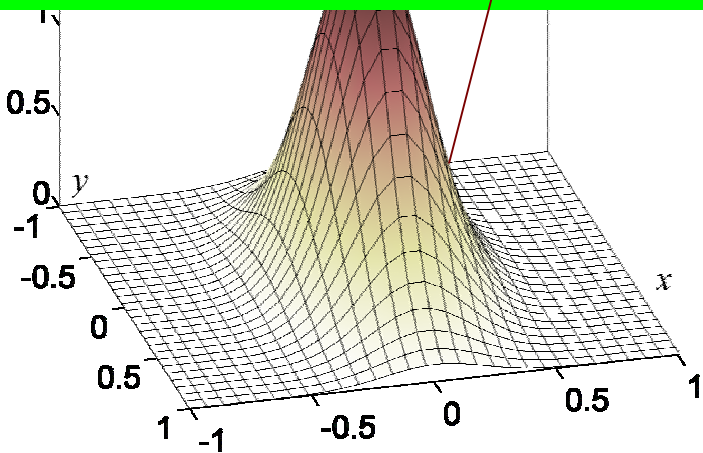
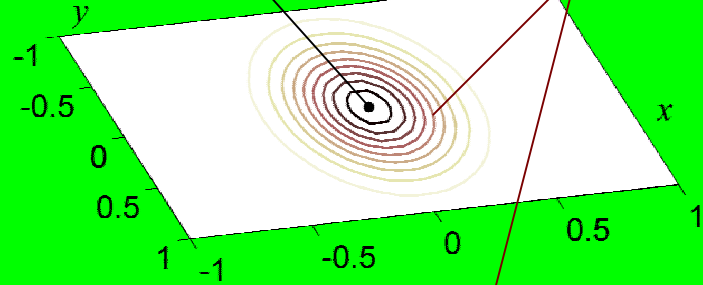
Modeling Classes of Patterns

Chaos-based representation of diversity, how does it look?

Classical method

stereotype:
point (equilibrium)

diversity:
probability distribution

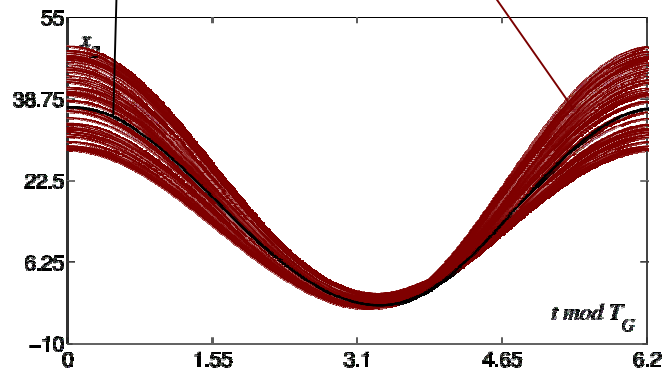
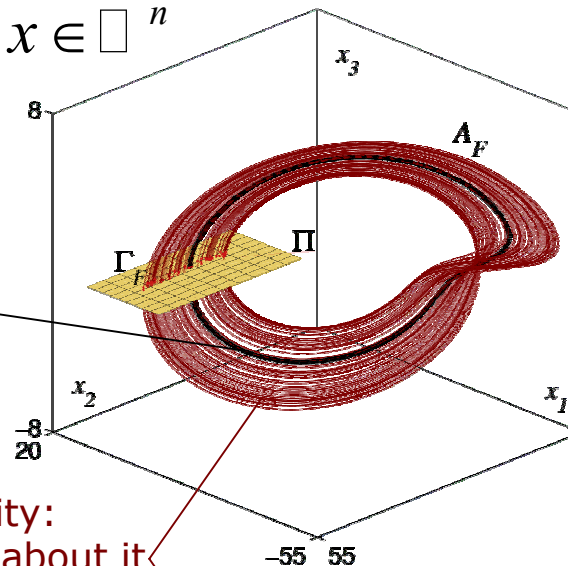


Periodic method

$$\dot{x} = F(x) \quad x \in \square^n$$

stereotype:
limit cycle

diversity:
chaos about it



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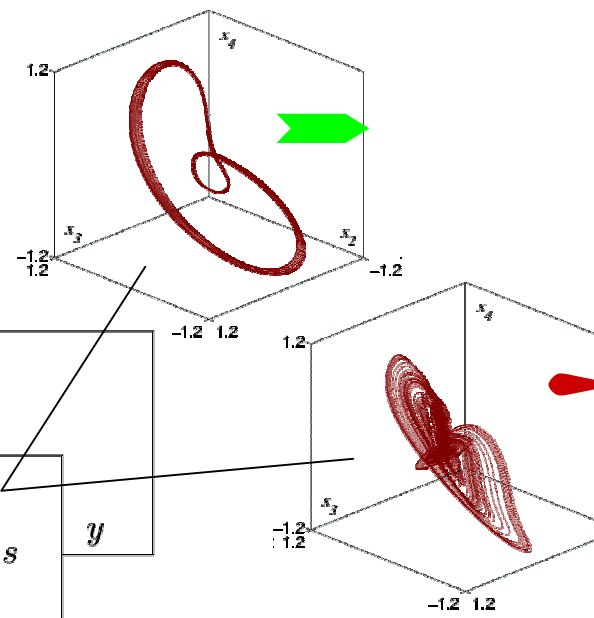
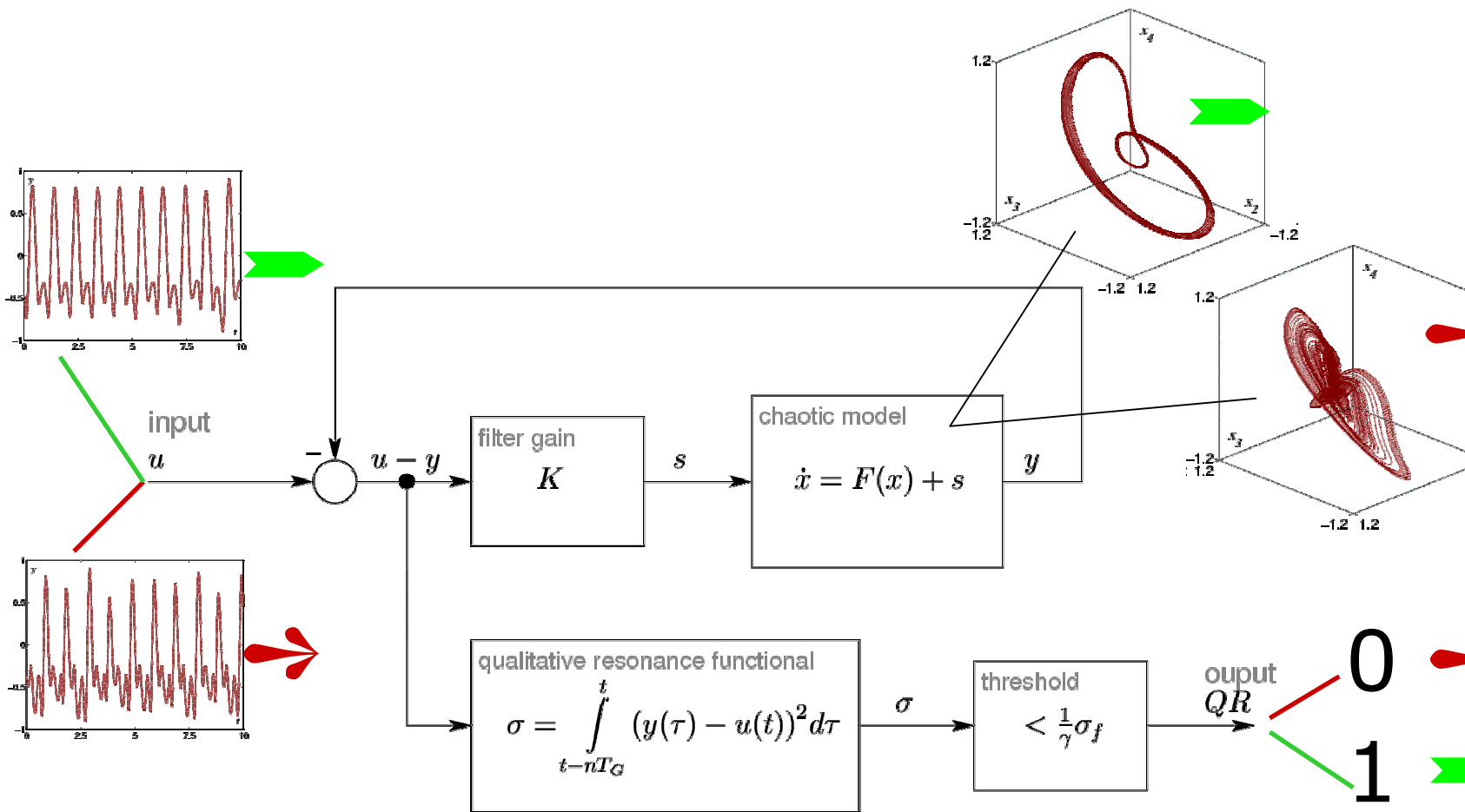




Recognition of Patterns

Synchronization-based pattern matching

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Workplan

Scientific workpackages



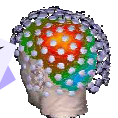
WP1 – Microscopic

- Understand of the role of irregular/periodic oscillation of neurons in coding imprecise information



WP2 – Engineering

- Developing a periodic-based coding scheme of perceptual information



WP3 – Macroscopic

- application of the approximate synchronization paradigm for the analysis of EEG signals



Conclusion ...

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TO KNOW MORE

...

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FOR YOU AT**

THE

POSTER!!!

