



# Health Forecast

## The Health Forecast Project, an Overview

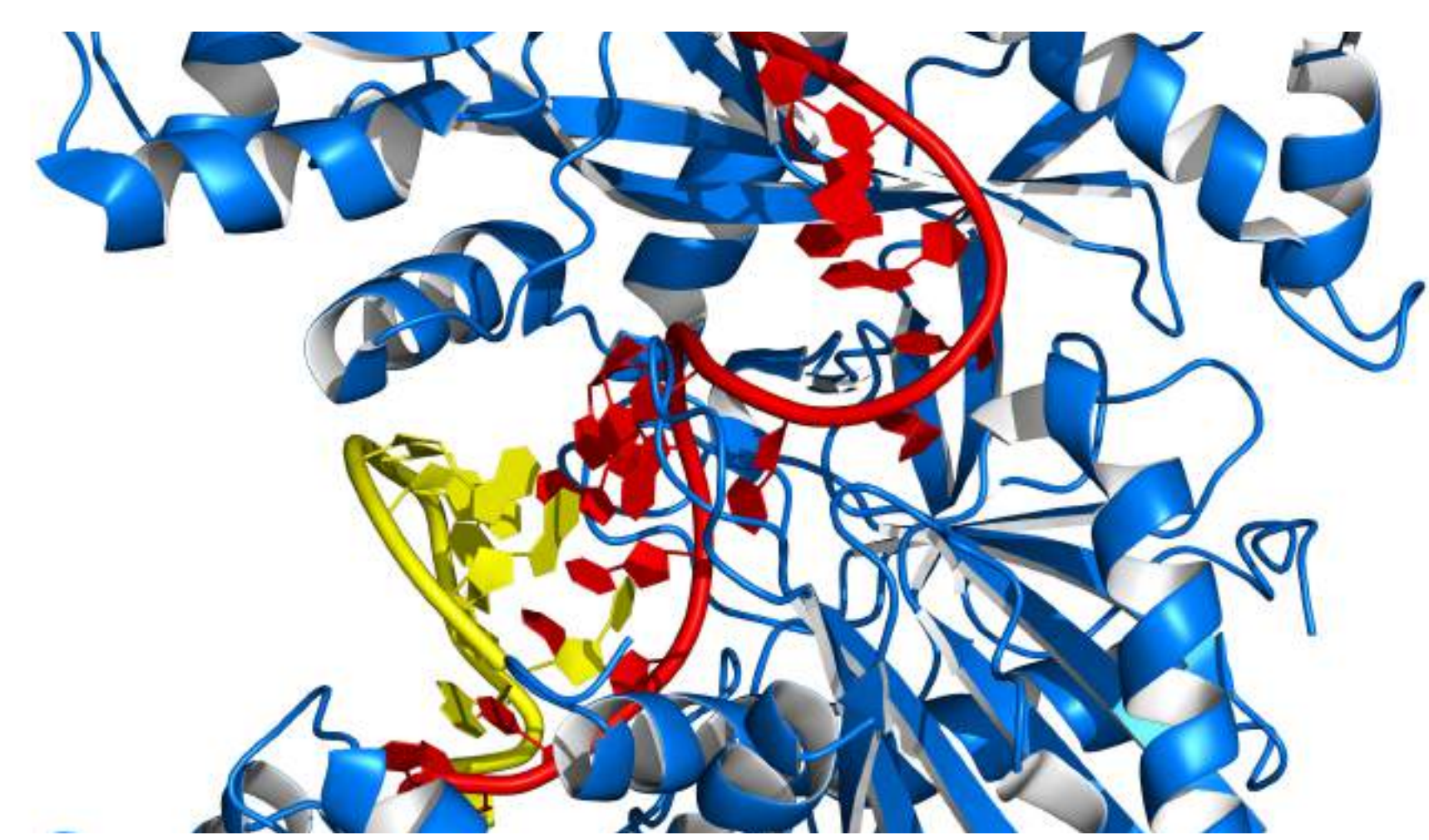
### BACKGROUND

- HF 2.0 aims at applying advanced machine-learning techniques to better understand the systems-biology processes associated with obesity (evolution of adipose tissue), sepsis (systemic response to infection) and diabetes.
- The idea is to create a bridge between dry-lab and wet-lab: a link between the bio-informatics tools routinely used by the omics labs and data-analysis and a machine-learning framework
- Nutrition: Evaluate the effect of a combination of a rice protein hydrolysate and a probiotic in preventing obesity and related co-morbidities in a pig model of childhood obesity.
- Sepsis: revise the current definitions of sepsis and develop a ML-based methodology for multi-scale stratification of patients with sepsis.
- Diabetes: epidemiologic (community) study of the incidence of Diabetes (mainly type II) from genomics and metabolomics. Establish a ML-based framework for building data-driven models.

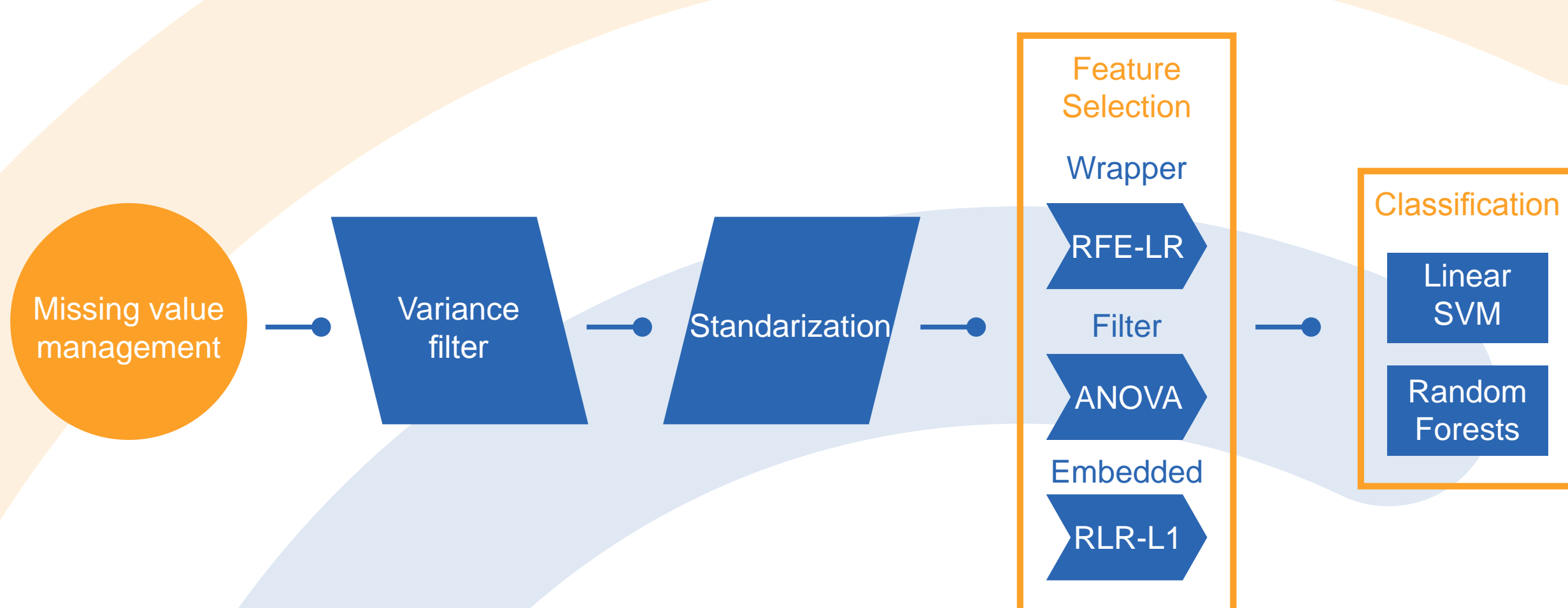


### METHODOLOGY

- The project deploys different methods for feature selection including wrapper, filter and embedded methods such as RFE-LR, ANOVA and RLR-L1.
- The project also uses state-of-the-art classification methods such as SVMs, Random Forests, Neural Networks and Deep Learning.
- Regarding knowledge discovery, HF uses graphical models combined with other standard methods such as PCA and FA.



### RESULTS



**Figure:** HF2.0 Analysis Pipeline

Successfully applied in the assessment of small cell Lung Cancer, Sepsis and Nutrition.

### CONCLUSIONS

- During the last 8 months, the HF project resulted in 2 international congress contributions and two papers in high impact journals.
- It is expected that the project will result in data analytics service in health-care.
- Through this initiative, EURECAT has consolidated relationships with important research institutions such as DIBAPS, MPPC and VHIR.
- As next steps, EURECAT will establish relationships with medtech companies.
- In the near future, the pipeline shall be improved with new classification methods mainly in the area of ensembles of heterogeneous models and graphical models.

#### PARTNERS



#### AUTHORS

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