

## I - Contextualization

**Chapter 1**  
From Speed Recommendation to Adaptive Control

## II - State of the Art

### Chapter 2.2

How can a learning architecture model non-linear, non-stationary dynamics from an online stream of data while avoiding catastrophic forgetting ?

### Chapter 2.1

How can a learning-based controller adapt continuously to non-stationary dynamics while maintaining reliability and safety ?

## III - Contributions

### Chapter 3

Context Ensemble Local Learning  
(CELL formalism  $\rightarrow$  oCELL  $\rightarrow$  kCELL)

### Chapter 4

Solving Control Tasks with CELL  
(Model Predictive Control)

### Chapter 5

Prospective works on scalability and use of CELL modularity  
(CELL formalism  $\rightarrow$  sgpCELL)

## IV - Conclusions and Future Research Directions

### Chapter 6

Industrial Use Cases

### Chapter 7

Conclusion and Future Works

Online Learning

Control with  
Learned Models