AIBT108 - Sequential Decision Making in AI

From the Advanced Master AIBT

(Artificial Intelligence & Business Transformation)

Key elements

Dates: **11 - 14 April 2022**

Duration: **28 hours, 4 days**

For whom:
recent graduates, jobseekers and experienced employees

Location:
ISAE-SUPAERO, Toulouse

Course fees: **2 300 €**

Language: **English**

Highlights

- Reinforcement Learning algorithms
- Choosing the right algorithm / application
- Practical redline on market optimization

True AI won't come without the ability to reason and plan ahead. Super-human video game playing, Go mastery, autonomous driving, dynamical systems control, supply chain management, are examples of recent AI successes and contribute to the strength of modern approaches. While Reinforcement Learning and AI planning and scheduling techniques appear as an asset for the future of organizations, companies and industries, making efficient strategic choices require a good understanding of their foundations, mechanics, intrinsic difficulties and practice.

Prerequisites

- General knowledge on computer science.
- Work experience in a professional environment.

Learning objectives

After completing this course, participants will be able to:

- Decide which method is relevant to solve a sequential decision problem.
- Know the foundations of RL, path planning, scheduling and decentralized decision methods
- Know the names and principles of the most recent algorithms
- Design simple proofs of concept based on these methods.

Practical information and registration

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Course Content

- Reinforcement Learning (RL)

  Main concepts of modern Deep RL algorithms.

  Hands-on: design a learning agent for autonomous driving.

  Illustration: drone control.
- Scheduling

  Main concepts of scheduling and different optimization methods and modeling frameworks.

  Hands-on: airline network optimization.

  Illustration: supply chain management.
- Path Planning

  Shortest path algorithms, heuristic search, motion planning.

  Hands-on: flight planning.

  Illustration: sense-and-avoid in robotics.
- Decentralized decision making

  Multi-agent concepts and game theory. Collaborative and adversarial decision making.

  Hands-on: multi-agent path planning
- Illustration: product/market optimization.

Teaching methods

Teaching methods	Yes
Lectures / tutorial	X
Collaborative learning	
Flipped classroom	
Blended learning (online and face to face)	
Learning by doing	X
Project-based	
Simulation	X
Case study	

Assessment

- Hands-on evaluation on a computer (100 %)