

TUPLES: New EU Project Aimed at Developing Trusted Planning and Scheduling Systems that Are Safe, Robust, and Explainable

A key point on the EU agenda is to ensure that artificial intelligence (AI) approaches are transparent, trustworthy, and robust when they are deployed in practice. This is an important yet ambitious goal, this is a goal that this new project will address.

Toulouse, 28 October 2022 – Funded by the Horizon Europe framework program, the recently launched **TUPLES (TrUstworthy Planning and scheduling with Learning and ExplanationS)** project aims to tackle these very important issues for planning and scheduling. This area of AI aims to build systems that assist humans in planning, organising and optimising courses of action to achieve complex objectives. These problems have always been at the heart of AI and arise in domains including robotics, space exploration, sports, manufacturing, and logistics. Unfortunately, current methods for tackling these problems do not inspire enough confidence to be widely adopted and have the expected impact.

The project will be led by planning expert Professor **Sylvie Thiébaux** at ANITI in France. It will involve four academic partners (ANITI, KU Leuven, Saarland University and the University of Bologna) and three companies (Airbus, Optit, and SciSports). **Scientifically, the project has three main goals.** First, it will **develop hybrid planning and scheduling methods** that combine the efficiency, flexibility, and adaptability of data-driven learning approaches with the robustness, reliability, and explainability of model-based reasoning methods. Second, it will **develop methods that can verify whether the plans and schedule adhere to certain properties** and explain the solutions produced by planning and scheduling systems. Finally, **the project will demonstrate these approaches on case studies** ranging from AI-based airplane pilot assistance, to prediction-based soccer team recruitment, and smarter greener waste collection.

"I am delighted to work with the top-notch team we have assembled to attack some of the most important problems in AI." said Professor Thiébaux. "Planning and scheduling has tremendous potential to deliver substantial benefits to industry and society, and the TUPLES consortium is eager to demonstrate the impact more trustworthy systems can achieve on real-world use cases".

The long-term goal of the project is to contribute to a cultural change that yields a more human-centered approach to the development of planning and scheduling tools. This change has the potential to increase the confidence in these tools and accelerate their adoption by industry and society. Indeed, the adoption of these decision support systems lags behind other areas of AI and data analytics. **Better and more trustworthy planning and scheduling approaches offer the potential to bring significant economic, environmental and social benefits** such as increased productivity, reduced risks, improved safety and working conditions, safeguarded resources and reduced pollution.

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Project Key Facts

Full Name

TUPLES (TrUstworthy Planning and scheduling with Learning and ExplanationS)

Start Date

1st October 2022

Duration

36 months

Budget

€ 3 798 285

Project Abstract

<https://cordis.europa.eu/project/id/101070149>

Coordinator

Communaute d'Universites et d'etablissements Universite Federale De Toulouse Midi-Pyrenees

Project Partners

ANITI, KU Leuven, Saarland University, University of Bologna, Airbus, Optit, SciSports.

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