

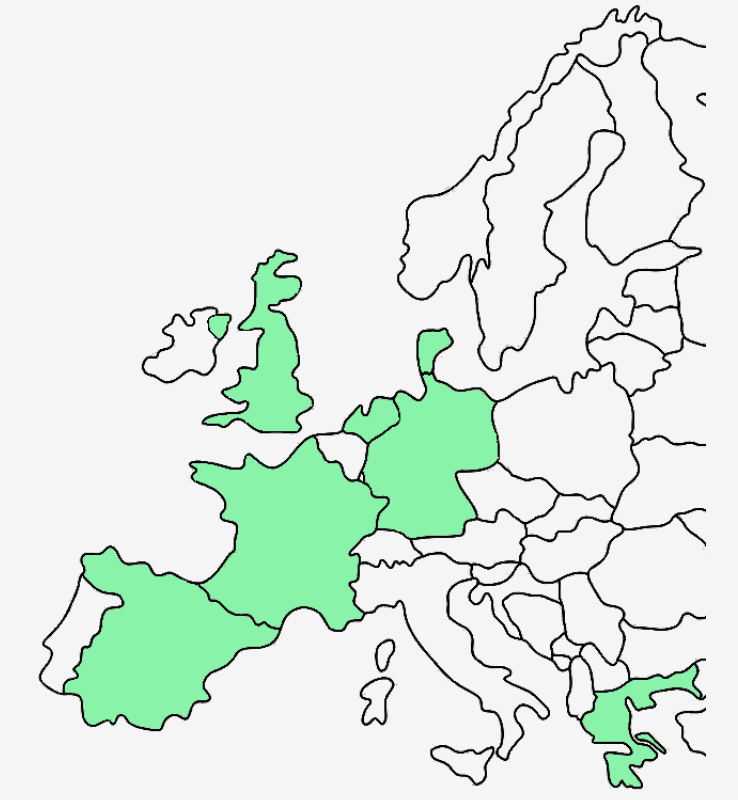
The TeamPlay project

Analysing and Optimising Time, Energy and Security for Cyber-Physical Systems

Grant Number: 779882

10 Partners, 7 Countries

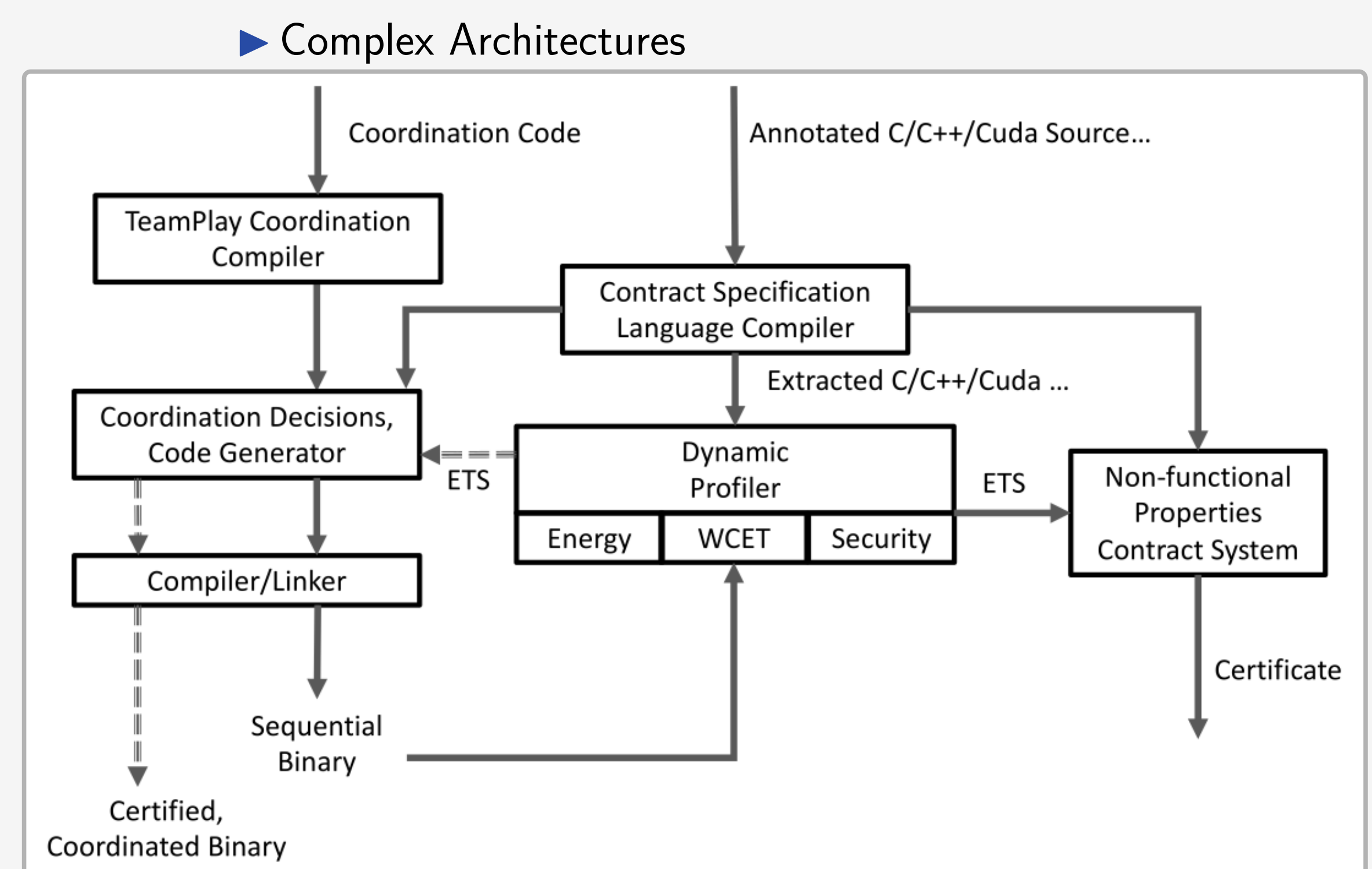
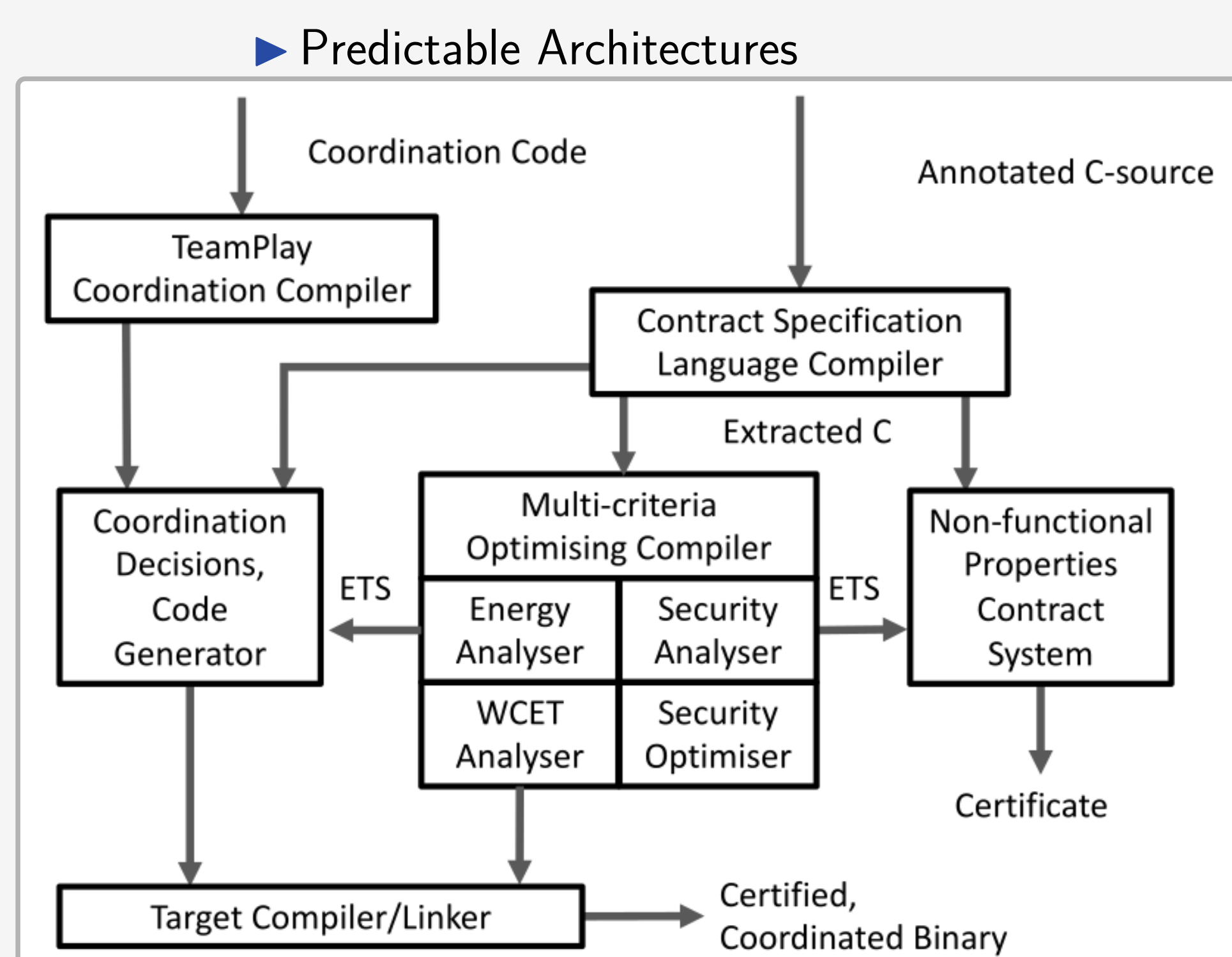
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- ▶ University of St Andrews (USTAN), UK
- ▶ Sky-Watch A/S (SKW), DK
- ▶ Syddansk Universitet (SDU), DK
- ▶ Universiteit van Amsterdam (UvA), NL



TeamPlay Goals & Challenges

- ▶ Non-functional properties (e.g. Energy usage, execution Time, Security) as first class citizens
- ▶ Enable the developer to reason about both the functional and the non-functional properties of their software at source code level.
- ▶ Allow programs to reflect directly on their own energy consumption, time, security, etc.,
- ▶ Effectively manage energy consumption for parallel systems while maintaining the right balance with time and security,
- ▶ Develop formally-motivated techniques that will allow energy usage, execution time, security, etc., of parallel software to be treated effectively.

The TeamPlay Methodology: Two workflows to analyse them all



The Use-Cases

UAV - Agriculture

- ▶ UAV detects ground-based hazards
- ▶ Fixed wing Opterra + Nvidia Jetson Nano



Camera Pill

- ▶ Perform endoscopy using a pill
- ▶ Cortex M0 + FPGA



Space Wire

- ▶ SpaceWire links
- ▶ GR712RC



Car Parking

- ▶ Core CNN to classify car-parking lots
- ▶ 2 platforms:
 1. Nvidia TK1
 2. STM32F091RC



Results

- ▶ Energy consumption improvement
- ▶ Timing controlled
- ▶ Processing time stabilised
- ▶ Security increased
- ▶ Tool flows successfully applied

Openings

- ▶ Programming language support
- ▶ Extend energy modelling to other platforms
- ▶ Raise the level of abstraction of Time, Energy, and Security

<https://teamplay-h2020.eu/>

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