

# Application BASTRI

## Fiches Equipes

### KAIROS (SR0763KR)

Temps Logique Multiforme pour Conception de Systèmes Cyber-Physiques  
AOSTE (SR0165VR) □ KAIROS

**Statut:** Décision signée

**Responsable :** Julien Deantoni (Par intérim)

**Mots-clés de "A - Thèmes de recherche en Sciences du numérique - 2024" :** A1.1.1.1. Multi-cœurs, pluri-cœurs, A1.1.2. Accélérateurs matériels (GPGPU, FPGA, DSP, etc.), A1.2.5. Internet des objets, A1.2.7. Systèmes cyber-physiques, A1.5.2. Systèmes communicants, A2.2. Compilation, A2.3. Systèmes embarqués et cyber-physiques, A2.4. Méthodes formelles pour vérification, sureté, certification, A2.5.1. Architecture, conception

**Mots-clés de "B - Autres sciences et domaines d'application - 2024" :** B5.1. Usine du futur, B5.4. Microélectronique, B6.1. Industrie du logiciel, B6.4. Internet des objets, B6.6. Systèmes embarqués, B6.7. Industrie informatique (matériels, équipements...), B7.2. Déplacements intelligents, B8.1. Bâtiments intelligents, B8.2. Ville connectée, B9.5.1. Informatique

**Domaine :** Algorithmique, programmation, logiciels et architectures  
**Thème :** Systèmes embarqués et temps réel

**Période :** 01/01/2017 -> 31/12/2025  
**Dates d'évaluation :** 19/03/2020 ,

**Etablissement(s) de rattachement :** CNRS, UCA  
**Laboratoire(s) partenaire(s) :** I3S (UMR7271)

**CRI :** Centre Inria d'Université Côte d'Azur  
**Localisation :** Centre Inria d'Université Côte d'Azur  
**Code structure Inria :** 041154-0

**Numéro RNSR :** 201722225N  
**N° de structure Inria:** SR0763KR

### Présentation

Kairos is working on how methods and tools to manage concurrency and time at different levels of abstraction. More precisely [KAIROS](#) studies the use of (formal) Logical Time, associated with Model-Based Design and Algorithm/Architecture Adaptation (AAA) approaches, for the modeling and analysis of Embedded and Cyber-Physical Systems. The Logical Time design approach, in which any relevant sequence of meaningful events can be seen as generating an abstract Logical Clock, is an extension of Synchronous Language and Scheduling Theories altogether: Multiformal Logical Clocks are used for specification, and the resolution into physical time behaviors is only performed for temporal verification and implementation.

The Kairos team is a follow-up of the [Aoste](#) project-team

### Axes de recherche

[KAIROS](#) aims at leveraging existing formal approaches from the theories of concurrency and scheduling to different application domains. As a starting point, [KAIROS](#) intends to deal with three domains (not entirely disjoint):

- Cyber-Physical System (CPS) Engineering (early specification phases)
  - Behavioural semantics driven Heterogeneous and Multi-view modeling
  - Formally defined Co-simulation
- Formal analysis of Reactive Programming for Connected Objects
- Application-Architecture Co-design for scheduling and allocation reasoning
  - Efficient Hardware/Software Interaction
  - Efficient Software *Massage* for Hardware Adaptation

### Relations industrielles et internationales

#### Contact

- **Responsable :** Julien Deantoni
- **Tél :** 04.92.38.79.41
- **Secrétariat Tél :** 04.97.15.53.80

#### En savoir plus

- Site sur [inria.fr](http://inria.fr)
- Derniers Rapports d'Activité : 2017 , 2018 , 2019 , 2020 , 2021 , 2022 , 2023

#### Documents sur la structure

- [Intranet](#)
- [Privés](#)

#### Décisions

- **11944** (13/12/2016) : création
- **12444** (01/01/2018) : prolongation
- **13232** (06/12/2018) : prolongation
- **13718** (08/07/2019) : création
- **14584** (09/12/2020) : prolongation
- **15178** (13/12/2021) : prolongation
- **16864** (01/03/2024) : cessation du responsable
- **16865** (01/03/2024) : nomination responsable

#### Localisation

- **Adresse postale :** Centre Inria d'Université Côte d'Azur 2004 Route des Lucioles - BP 93 06902 Sophia Antipolis cedex France
- **Coordonnées GPS :** 43.616, 7.068

We hold close relations with the communities of Synchronous Reactive Languages, and Model-Based System Engineering for Cyber-Physical systems.

We have contractual industrial collaborations with companies such as Thales Alenia Space, Thales, Safran, Airbus, Renault, as well as tool providers in the doamine of MBSE for CPS and IoT.