TRIPOP (SR0806IR)

Modélisation, simulation et commande des systèmes dynamiques non lisses
BIPOP (SR0020TR) ☐ TRIPOP ☐ TRIPOP (SR0879YR)

Statut: Terminée

Responsable : Vincent Acary

Mots-clés de "A - Thèmes de recherche en Sciences du numérique - 2023" : *Aucun mot-clé.*

Mots-clés de "B - Autres sciences et domaines d'application - 2023" : *Aucun mot-clé.*

Domaine : Mathématiques appliquées, calcul et simulation
Thème : Optimisation et contrôle de systèmes dynamiques

Période : 01/01/2018 -> 31/05/2019
Dates d'évaluation :

Etablissement(s) de rattachement : <sans>
Laboratoire(s) partenaire(s) : <sans UMR>

CRI : Centre Inria de l'Université Grenoble Alpes
Localisation : Centre de recherche Inria de l'Université Grenoble Alpes
Code structure Inria : 071133-0

Numéro RNSR : 201822629Y
N° de structure Inria: SR0806IR

Présentation

The TRIPOP team is a joint research team of Inria Grenoble Rhone-Alpes and of the Laboratoire Jean Kuntzmann. This new team is a follow up of the BIPOP team (2003–2017). The team is mainly concerned by the modeling, the mathematical analysis, the simulation and the control of nonsmooth dynamical systems. Nonsmooth dynamics concerns the study of the time evolution of systems that are not smooth in the mathematical sense, i.e., systems that are characterized by a lack of differentiability, either of the mappings in their formulations, or of their solutions with respect to time. In mechanics, the main instances of nonsmooth dynamical systems are multibody systems with Signorini unilateral contact, set-valued (Coulomb-like) friction and impacts. In Electronics, examples are found in switched electrical circuits withe ideal components (diodes, switches, transistors). In Control, nonsmooth systems arise in the sliding mode control theory and in optimal control. A lot of examples can also be found in cyber-physical systems (hybrid systems), in transportation sciences, in mathematical biology or in finance.

Axes de recherche

- Axis 1: Modeling and analysis
    1. Multibody vibro-impact systems
    2. Excitable systems
    3. Nonsmooth geomechanics and natural hazards assessment
    4. Cyber-physical systems (hybrid systems)
- Axis 2: Numerical methods and simulation
    1. Geometric time–integration schemes for nonsmooth Initial Value Problem
    2. Stability and numerical continuation of invariants
    3. Numerical optimization for discrete nonsmooth problems
- Axis 3: Automatic Control
    1. Discrete-time Sliding-Mode Control (SMC) and State Observers (SMSO)
    2. Optimal Control
    3. Control of nonsmooth discrete Lagrangian systems
    4. Switching LCS and DAEs, higher-order sweeping process (HOSwP)
    5. Control of Elastic (Visco-plastic) systems with contact, impact and friction

Relations industrielles et internationales

Contact

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En savoir plus

- Site sur inria.fr
- Site du responsable
- Derniers Rapports d'Activité : 2018 , 2019 , 2020 , 2021 , 2022 , 2023

Documents sur la structure

- Intranet
- Privés

Décisions

- 12443 (10/11/2017) : création
- 13271 (18/12/2018) : prolongation
- 13658 (05/06/2019) : fermeture

Localisation

- **Adresse postale :** Centre de recherche Inria de l'Université Grenoble Alpes Inovallée 655 Avenue de l'Europe - CS 90051 38334 Montbonnot CEDEX France
- **Coordonnées GPS :** 45.218, 5.807

Industrial collaborations: Schneider Electric, STRTMG, Dassault Systems, EDF,

Academic collaborations:

- International:
    - University of Wisconsin/Madison, USA
    - McGill University, Canada.
    - Université de Liége, Belgium
    - Universidad Nacional del Litoral / Conicet, Argentina.
    - Universidad de Chile, Chile
- France:
    - ENTPE
    - ENSTA ParisTech
    - Université de Limoges
    - Université de Paris-Sorbonne
    - LAAS
    - INRIA Lille, Rennes and Paris