

# Application BASTRI

## Fiches Equipes

### TRIPOP (SR0879YR)

Modélisation, simulation et commande des systèmes dynamiques non lisses  
TRIPOP (SR0806IR) □ TRIPOP

**Statut:** Décision signée

**Responsable :** Vincent Acary

**Mots-clés de "A - Thèmes de recherche en Sciences du numérique - 2024" :** *Aucun mot-clé.*

**Mots-clés de "B - Autres sciences et domaines d'application - 2024" :** *Aucun mot-clé.*

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

**Période :** 01/06/2019 -> 31/12/2026  
**Dates d'évaluation :** 12/01/2022

**Etablissement(s) de rattachement :** CNRS, UGA  
**Laboratoire(s) partenaire(s) :** LJK (UMR5224)

**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:** SR0879YR

### Présentation

The TRIPOP team (2018- ) is a joint research team of [Inria Grenoble Rhone-Alpes](#) and of the [Laboratoire Jean Kuntzmann \(LJK\)](#). This team is a follow up of the [BIPOP](#) team (2003–2017). The team is mainly concerned with the modeling, the mathematical analysis, the simulation and the control of nonsmooth dynamical systems, with a strong application to modeling natural environmental risks in mountains. For the period 2022-2025, the team is organized along two research axes: 1) nonsmooth simulation and numerical modeling for natural gravitational risks in the mountains and 2) modeling, simulation and control of nonsmooth dynamical systems. The idea is to put forward a strong application axis with a major societal impact in the climate change area, and for which there is a strong academic research dynamic in the Greble region and a network of socio-economic actors very interested in an industrial transfer of digital science methods on these subjects.

### Axes de recherche

Axis 1: Nonsmooth simulation and numerical modeling for natural gravitational risk in mountains.

- Rockfall trajectory modeling
- Modeling and simulation of gravity hazards (debris flows, avalanches and large-scale rock flows)
- Data-driven modelling for prediction and mitigation of gravity hazards

Axis 2: Modeling, simulation and control of non-smooth dynamical systems

- Modeling, analysis and numerical method.
  1. Multibody vibro-impact systems
  2. Systemic risk
  3. Cyber-physical systems (hybrid systems)
  4. Numerical optimization for discrete nonsmooth problems
- Automatic Control
  1. Discrete-time Sliding-Mode Control (SMC) and State Observers (SMSO)
  2. Control of nonsmooth discrete Lagrangian systems
  3. Switching LCS and DAEs

**Relations industrielles et internationales**

### Contact

- **Responsable :** Vincent Acary
- **Tél :** 04.76.61.52.29
- **Secrétariat Tél :** 04.76.61.52.59

### En savoir plus

- Site de l'équipe
- Site sur [inria.fr](#)
- Site du [responsable](#)
- Derniers Rapports d'Activité : [2018](#) , [2019](#) , [2020](#) , [2021](#) , [2022](#) , [2023](#)

### Documents sur la structure

- [Intranet](#)
- [Privés](#)

### Décisions

- [13604](#) (20/05/2019) : création
- [15186](#) (14/12/2021) : prolongation
- [15853](#) (14/12/2022) : prolongation
- [16225](#) (02/06/2023) : prolongation

### 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: Géolithe, SNCF, STRTMG, Safran Tech, Schneider Electric,

Academic collaborations:

- International:
  - University of Wisconsin/Madison, USA
  - McGill University, Canada.
  - Université de Liège, 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