

Application BASTRI

Fiches Equipes

TITANE (SR0554CR)

Modélisation géométrique d'environnements 3D
GEOMETRICA (SR0182KR) □ TITANE □ TITANE (SR0623ZR)

Statut: Terminée

Responsable : Pierre Alliez

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 : Perception, cognition, interaction
Thème : Interaction et visualisation

Période : 01/01/2013 -> 31/12/2013
Dates d'évaluation :

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

CRI : Centre Inria d'Université Côte d'Azur
Localisation : Centre Inria d'Université Côte d'Azur
Code structure Inria : 041141-0

Numéro RNSR : 2013210855
N° de structure Inria: SR0554CR

Présentation

Geometric modeling and processing revolve around three main end goals: a computerized shape representation can be visualized, simulated or realized. Central research themes in geometric modeling involve conversions between physical (real), discrete (digital), and mathematical (abstract) representations. Going from physical to digital is referred to as shape acquisition and reconstruction; going from mathematical to discrete is referred to as shape approximation and mesh generation; going from discrete to physical is referred to as shape rationalization. Geometric modeling has become an indispensable component for computational and reverse engineering. Simulations are now routinely performed on complex shapes issued not only from computer-aided design but also from an increasing amount of available measurements. The scale of acquired data is quickly growing: we no longer deal exclusively with individual shapes, but with entire scenes, possibly at the scale of entire cities, with many objects defined as structured shapes. We are witnessing a rapid evolution of the acquisition paradigms with an increasing variety of sensors and the development of community data, as well as disseminated data. Tackling all these changes requires researching on foundations and algorithms in large-scale geometric modeling from measurements.

Axes de recherche

Our overall objective is the computerized geometric modeling of complex scenes from physical measurements. On the geometric modeling and processing pipeline, this objective corresponds to steps required for conversion from physical to effective digital representations: analysis, reconstruction and approximation. The related scientific challenges include i) being resilient to defect-laden data due to the uncertainty in the measurement processes and imperfect algorithms along the pipeline, ii) being resilient to heterogeneous data, both in type and in scale, iii) dealing with massive data, and iv) recovering or preserving the structure of complex scenes. We define the quality of a computerized representation by its i) geometric accuracy, or faithfulness to the physical scene, ii) complexity, iii) structure accuracy and controllability, and iv) amenability to effective processing and high level scene understanding.

Relations industrielles et internationales

- Caltech (USA): We collaborate with the Applied Geometry Lab (headed by Prof. Desbrun) on discrete differential modeling applied to geometric modeling and processing problems. - RWTH Aachen (headed by Prof. Kobbelt): We are collaborating on quadrangle surface tiling. - IGN (French mapping agency): analysis and reconstruction of urban scenes. - Université de Lyon: We collaborate since with the GEOMOD team headed by Raphaëlle Chaine, on

Contact

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En savoir plus

- Site de l'équipe
- Site sur inria.fr
- Site du [responsable](#)
- Derniers Rapports d'Activité : [2016](#), [2017](#), [2018](#), [2019](#), [2020](#), [2021](#), [2022](#), [2023](#)

Documents sur la structure

- [Intranet](#)
- [Privés](#)

Décisions

- [9093](#) (08/01/2013) : création
- [9096](#) (08/01/2013) : nomination responsable
- [9818](#) (20/12/2013) : fermeture

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

scalable mesh generation and surface reconstruction. - Culture 3D clouds (grand emprunt project started in 2012): reconstruction of 3D scenes in cultural heritage. - Geometry Factory: We transfer some of our research results into the CGAL library, commercialized and maintained by Geometry Factory. - Acute3D: we collaborate on reconstruction and semantization of urban scenes. - Astrium: we are advising a Ph.D. thesis on reconstruction of indoor scenes. - Technicolor Rennes: we are advising a Cifre Ph.D. thesis on robust watermarking of 3D models.