![Inria logo]

Offer #2024-08325

Internship – Creation of a mobile Raspberry Pi-based 4D model capture platform

Contract type : Internship

Level of qualifications required : Master's or equivalent

Fonction : Internship Engineering

About the research centre or Inria department

The Centre Inria de l'Université de Grenoble groups together almost 600 people in 23 research teams and 9 research support departments.

Staff is present on three campuses in Grenoble, in close collaboration with other research and higher education institutions (Université Grenoble Alpes, CNRS, CEA, INRAE, …), but also with key economic players in the area.

The Centre Inria de l'Université Grenoble Alpes is active in the fields of high-performance computing, verification and embedded systems, modeling of the environment at multiple levels, and data science and artificial intelligence. The center is a top-level scientific institute with an extensive network of international collaborations in Europe and the rest of the world.

Context

The Kinovis platform [1] at Inria Grenoble allows the simultaneous acquisition of 68 color video streams up to 50Hz in a 10mx10m studio, then to reconstruct textured 4D (3D+t) models [2]. These models are used in different rendering applications (cinema/TV, fashion, art) and motion measurement (sport, medical).

These reconstruction methods are typically applied to data acquired in a fixed indoor studio, but a growing number of applications require temporary use of this type of in-situ platforms, for example in hospitals, sports fields, theaters, etc … While it is possible to move such platforms, the amount of equipment and the cabling time but also their often prohibitive cost are obstacles to such operations.

Assignment

The overall goal of the internship is therefore to lay the first software and hardware bricks of an easily transportable and reasonably priced multi-camera capture system based on a Raspberry Pi (RPI) network to capture videos in order to reconstruct 4D models.

Main activities

The first goal will be to define and test a hardware infrastructure that allows to capture videos in a perfectly synchronous manner on several devices. Particular emphasis will be placed on the simplicity of installation, and in particular the minimization of the number of cables.

The second goal will be to develop the first software bricks that allow to exploit this platform, for example:

- code deployment on the RPIs
- camera control
- video pre-processing on the cameras (for example: detection of calibration grids, segmentation, compression …)

This effort can be based on existing projects such as [3] (half open-source, half-commercial).

The internship will be supervised by Julien Pansiot (Kinovis platform engineer), in collaboration with other engineers from the Experimentation & Development Service (SED) and the Morpheo research team.

References

1. Plate-forme Kinovis https://kinovis.inria.fr
2. Millimetric Human Surface Capture in Minutes. B. Toussaint, L. Boissieux, D. Thomas, E. Boyer , J-S Franco. SIGGRAPH Asia 2024, Tokyo, Japan. pp.1-12, https://inria.hal.science/hal-04724016v2
3. https://www.pi3dscan.com

Skills

This internship is targetted towards M1/M master students.

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage under conditions

Remuneration

Gratification = 4,35 € gross / hour

General Information

- **Town/city :** Montbonnot
- **Inria Center :** Centre Inria de l'Université Grenoble Alpes
- **Starting date :** 2025-02-01
- **Duration of contract :** 6 months
- **Deadline to apply :** 2024-12-05

Contacts

- **Inria Team :** SED-RAL
- **Recruiter :**
  Pansiot Julien / julien.pansiot@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

The keys to success

Bases in computer vision, 3D modeling and C++ and Python programming is expected.

Instruction to apply

Applications must include a CV, covering letter, copy of diploma and valid proof of disabled worker status.

Defence Security :
This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST).Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

Recruitment Policy :
As part of its diversity policy, all Inria positions are accessible to people with disabilities.