2019-01750 - Post-Doctoral Research Visit F/M Personalising Virtual Character Motions for Crowd Animation

Type de contrat : CDD
Niveau de diplôme exigé : Thèse ou équivalent
Fonction : Post-Doctorant

A propos du centre ou de la direction fonctionnelle

Inria, the French national research institute for the digital sciences, promotes scientific excellence and technology transfer to maximise its impact. It employs 2,400 people. Its 200 agile project teams, generally with academic partners, involve more than 3,000 scientists in meeting the challenges of computer science and mathematics, often at the interface of other disciplines. Inria works with many companies and has assisted in the creation of over 160 startups. It strives to meet the challenges of the digital transformation of science, society and the economy.

Contexte et atouts du poste

This research fellow position is funded by the ANR JCJC Per² project (Perception-based Human Motion Personalisation), and the candidate will participate in the research conducted by the group working on Character Animation and Crowd Simulation.

Starting date: flexible, starting anytime from now
Duration: 18-month contract

Mission confiée

Context

The overall project targets the personalisation of virtual human motions, which have become a requisite to create always more lifelike virtual worlds for industries ranging from entertainment to training and education. Although the visual realism of virtual human motions has drastically improved over the last decades, current animation techniques still create a certain uniformity of motion across characters. For single individuals (e.g., a main character), displaying the same generic motions for all users can limit their engagement, as motions are not personalised for any user. Similarly, the absence of variation in large groups of individuals also affects realism when they all move in the same manner. Tremendous amounts of manual artistic work can indeed create such variations, which undeniably improves overall realism (e.g., crowds in computer generated movies like Warcraft, Star Wars, The Hobbit), however it is still impossible to automatically create such levels of personalisation for interactive applications.

While this need for greater perceptual variety in virtual characters has been identified, existing approaches usually focus on variations of their visual aspect, i.e., appearance and shape [MLD+08,MLH+09]. However, motions are extremely important for humans to perform actions and to express themselves, in particular in nonverbal communication. Therefore, this project aims at creating variety in human motions, in order to create a new generation of more realistic virtual characters. However, variety is not simply a reflection of random differences, but results from complex intra-individual (e.g., fatigue) and inter-individual (e.g., morphology, age, sex, emotions) differences, which are seldom taken into account today in virtual characters. As such differences can be difficult to quantify, this project focuses on how viewers perceive motion variations, to automatically produce natural motion personalisation accounting for inter-individual variations. In short, our goal is to automate the creation of motion variations to represent given individuals according to their own characteristics, and to produce natural variations that are perceived and identified as such by users.

Principales activités

Position

The candidate will therefore participate in the Per² project by exploring how virtual character motions can be personalised to meet the requirement of crowd animations. The main task of the candidate will be to explore how animation methods can be adapted to produce efficiently and realistically variations in the motions of large numbers of virtual characters, and to identify the best means of producing variations in such scenarios. In particular, one
area to explore will be identifying through perceptual experiments how, when and where to add variations in the motions of groups of individuals. Then such insights will be used to design adaptive perception-based methods automatically providing the best trade-off between visual realism and computation load, as we demonstrated that introducing variety in crowd animations motions contribute to the overall naturalness of virtual scenes [HOKP16].

The candidate will be part of the local group working on Character Animation and Crowd Simulation, and will participate in the supervision of the PhD students and interns involved on the related projects (including ANR JCJC Per2, EU H2020 ICT 25 CROWDBOT, EU H2020 ICT 25 PRESENT, EU H2020 ITN CLIPE).

Environment

The candidate will work in the MimeTIC team in the joined Inria / IRISA research centre located in Rennes. Inria (www.inria.fr) and IRISA (http://www.irisa.fr/) are amongst the leading research centres in Computer Sciences in France, and the MimeTIC team is internationally recognised in the fields of Computer Graphics and Virtual Human Simulation. Research activities in MimeTIC focus on simulating virtual humans that behave in a natural manner and act with natural motions.

Keywords and References

Virtual Characters, Human Motion, Crowd Animation, Perception


Compétences

Requirements for candidacy

The candidate must have a PhD degree in Computer Sciences, in the field of Computer Vision, Computer Graphics or Simulation. Beyond scientific excellence, we will consider candidates with excellent organization and communication skills.

Application

We are looking for motivated candidates, please send CV, a motivation letter, reference letters, and any relevant material to ludovic.hoyet@inria.fr, anne-helene.olivier@inria.fr and julien.pettre@inria.fr.

Avantages

- Subsidized meals
- Partial reimbursement of public transport costs

Rémunération

Monthly gross salary amounting to 2 653 euros

Informations générales

- **Thème/Domaine** : Interaction et visualisation
  Plateformes expérimentales logiciel (BAP E)
- **Ville** : Rennes
- **Centre Inria** : CRI Rennes - Bretagne Atlantique
- **Date de prise de fonction souhaitée** : 2020-03-01
- **Durée de contrat** : 1 an, 6 mois
- **Date limite pour postuler** : 2020-06-30

Contacts

- **Équipe Inria** : MIMETIC
- **Recruteur** : Hoyet Ludovic / ludovic.hoyet@inria.fr

A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 200 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3500 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 180 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation
Consignes pour postuler

Please submit online: your resume, cover letter and letters of recommendation eventually

Sécurité défense :
Ce poste est susceptible d'être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L'autorisation d'accès à une zone est délivrée par le chef d'établissement, après avis ministériel favorable, tel que défini dans l'arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l'annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.