Collision Detection and Motion Planning for Large-Scale Virtual Environments

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Available positions:

- Research professor and post-doctorate

Project descriptions:

We are interested in designing scalable and interactive collision detection and motion planning techniques for large-scale virtual environments and virtual prototyping. Some of large-scale CAD environments include Boeing 777 datasets and double eagle oil tanker models that take more than multiple gigabytes. We would like to design efficient assembly/disassembly and other various virtual prototyping tools that can handle such large-scale virtual environments. In this project, we will design scalable proximity queries (e.g., collision detection) for motion planning problems in the context of large-scale virtual environment. We will also design interactive techniques that are applicable to real robots in complex environments.

Related publications:

- Hybrid parallel continuous collision detection: http://sglab.kaist.ac.kr/HPCCD/
- Fracturing-aware stable collision detection: http://sglab.kaist.ac.kr/FASTCD/
- SR-RRT: Selective Retraction-base RRT Planner, under submission; this work is related to: http://gamma.cs.unc.edu/RRRT/)
- Interactive techniques for large-scale models: http://sglab.kaist.ac.kr/paper/Tutorial_CGASE.pdf

Requirement and job descriptions:

Research professor and postdoc:

- Ph.D. degree in computer graphics or related in computer science is necessary. A research record is requested. He or she will mainly work on various research activities including paper writing and attending conferences.
- Research professor and postdoc will be supported at least one year. Also, it can be extended to multiple years up to three years.
- Yearly stipends for research professor and postoc. are 40M Korean won and 30M Korean won respectively. (1K Korean won is approximately 1 USD)

Contact:

- Send your resume to the PI, Sung-eui Yoon (sungeui@gmail.com)

Location:

KAIST is a research-oriented school and one of top engineering schools in South Korea. All the students including undergraduate, graduate, post-doc can stay at in-school dormitory. Also, KAIST is friendly to international students and researchers; there are many international students at KAIST. KAIST is located in DaeJeon, which is

located in almost center of South Korea; refer to the following site: http://www.metro.daejeon.kr/english/index.jsp. Population of DaeJeon is about 1.5 million. Typical living cost of DaeJeon is relatively cheap. Our lab has 12 graduate students including two foreign students.