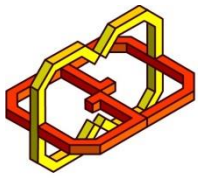

Technion-Israel Institute of Technology

Computer Science Department

Center for Graphics and Geometric Computing

CGGC Seminar – PhD Talk

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Multidimensional Multimodal Content-Oriented Presentations

Contemporary presentation software provides sufficient tools for simple presentation scenarios. However, such tools have not changed for about two decades and are unsuitable for many complex modern needs. Content is typically limited to text and images only and cannot be expressed well in terms of 2D slides and bullets quantization. Such limitations are ill-suited for many modern needs where linear sequences of fixed-sized 2D slides consisting of text and images is not nearly sufficient.

In this work, we propose a presentation system aimed at overcoming the limitations of the contemporary presentation software. To achieve this goal, we abandon the usual concept of a presentation as a 2D slide sequence, and instead treat them as continuous, automatically created, 3D scenes of non-linear hierarchical structure with multi-modal content, all without requiring any (3D) professional skills from the end user.

Moving from the concept of discrete sequences of 2D slides towards smooth 3D multi-modal hierarchical presentations poses many difficulties, one of which is how to arrange content in a 3D space. This task becomes further complicated when the story-graph of the presentation is evolving and is more complex than a single linear story-path. In this work, we describe in detail a framework for automatically solving the task of 3D content placement, which is based on views --- 3D replacement for slides. We examplify our proposed approach with two spatial layouts for 3D non-linear presentations: ``nested spheres'' and a `building', as well as algorithms that automatically create these layouts from an abstract hierarchical story-graph.

The techniques developed during this research for 3D presentations are also applicable in other fields. One such example is education. Native support for 3D content and interactivity opens an opportunity to create educational materials that are significantly more demonstrative and thus efficient, especially in the fields that include inherently 3D phenomena, such as geometry and physics. As another example, the hierarchical structure of a 3D scene combined with non-linear connections between the views is also present in visualization of various kinds of traffic.
We explore the possibilities opened by this similarity by creating an interactive visualization system for monitoring and analyzing traffic data on a 3D globe. Our system is general and can be transparently used in different domains, which we examplify by two simulated demonstrations of use cases: Logistic Service and Data Communication. Using these examples, we show that our approach is more general than the current state of the art, and that there are significant similarities between several domains in need of interactive visualization, which are mostly treated as completely separate.

The lecture will be held on Sunday, 08.03.2020, at 13:30, Taub 301

הזמנה זו מהווה אישור כניסה עם רכב לטכניון