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Foreword to special section on graphics interface 2015

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Editorial

Foreword to special section on Graphics Interface 2015

This special section of the Computers & Graphics (C&G) Journal features expanded versions of five of the top graphics and interactions papers [1–5] that were originally presented at Graphics Interface (GI) 2015, which took place in Halifax, Nova Scotia, Canada, between June 3rd and 5th. GI, sponsored by the Canadian Human–Computer Communications Society, is an annual international conference devoted to computer graphics and human–computer interaction (HCI). With a graphics track and an HCI track having equal weights in the conference, GI offers a unique venue for a meeting of minds working on computer graphics and interactive techniques. GI is the longest running conference in the field (the first conference was held in 1969), consistently attracting high-quality submissions from graphics, HCI, as well as visualization.

From the 35 papers presented at GI'15, the program chairs, in consultation with the program committee members, selected five papers in the areas of graphics and interactions with graphics. Authors were invited to submit extended versions that contain at least 30% new text and content, which could consist of additional experiments, analysis, descriptions, derivations, discussions or implementation details. Revised manuscripts also incorporate comments received at the conference and the reviews of the original paper. Each special section submission was reviewed by a minimum of three reviewers, with reviewing continuity. In the end, all five invited submissions were accepted for inclusion in this special section.

On the graphics side, Bera et al. [6] present a trajectory extraction and behavior-learning algorithm for data-driven crowd simulation, reflecting on-going research carried out at one of the leading research groups working in the areas of crowd analysis and simulation. Their formulation is based on incrementally learning pedestrian motion models and behaviors from crowd videos. Combining the learned model with an online tracker, accurate and smooth pedestrian trajectories can be computed. Benefits of the approach for improved data-driven crowd simulation are demonstrated by crowd replication from videos and merging the behavior of pedestrians from multiple videos.

Also from the graphics group at UNC, the work by Sterling and Lin [7] explores texture mapping as a unified representation for enabling realistic multimodal interaction with surfaces exhibiting fine details. Specifically, their work shows how both normal maps and relief maps can be adopted as unified representations to handle collisions with textured rigid body objects, synthesize complex sound effects from long-lasting collisions, and perform rendering of haptic textures. The resulting multimodal display system allows a user to see, hear, and feel complex interactions with textured surfaces, all achieved with a significant performance speedup and storage reduction.

Switching from simulation to model synthesis, the work by Zhang et al. [8] took on the challenge of 3D indoor scene modeling from a single image. Since the problem is ill-posed, the work relies on a data-driven framework which utilizes existing model libraries for image analysis, model retrieval, and relevance feedback. Extensive experimental results demonstrate the feasibility of the data-driven framework for efficient and automatic 3D scene reconstruction inspired by single images.

On the HCI side, two papers were selected. Vinayak and Ramani [9] explore the design of interaction techniques for mid-air shape deformation of regular geometric (pottery) objects. Their work uses a depth-camera to capture hand poster and movement, and then use this to deform the object. They evaluate several different techniques using user studies, and conclude that their techniques can provide for expressive intent.

Finally, Taranta et al. [10] present a simple streamlined gesture matching technique, where gestures here are referring to the sort of pen/mouse path gestures that you might have found on your PalmPilot – though they continue to have meaningful utility in interaction. The technique relies on simple arithmetic operations, which improves recognition time across a broader set of templates than in the past (i.e. a performance contribution). Finally, they evaluate this system with a user study (video game), and demonstrate its utiltiy/effectiveness.

We thank all the international program committee members and external reviewers for their review effort; some of them produced quality reviews for both the conference and journal cycles. We are grateful to all the supporting staff for GI who made the conference in Halifax a great success. Special thanks go to Paul Kry, President of the Canadian Human Computer Communications Society, for his passion and stewardship of all matters related to GI, and to Joaquim Jorge, editor-in-chief of C&G, for his strong and continued support in promoting top GI papers in the journal. Last and not the least, thanks also go to the journal supporting staff, in particular, Yanhong Zhai, for ensuring timely publication of the special section papers.

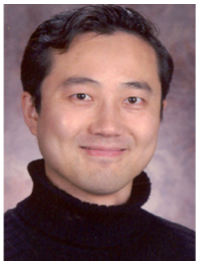
References

[1] Bera A, Kim S, Manocha D. Efficient trajectory extraction and parameter learning for data-driven crowd simulation. In: Proceedings of graphics interface, 2015. p. 65–72.

[2] Sterling AB, Lin MC. Integrated multimodal interaction using normal maps. In: Proceedings of graphics interface, 2015, p. 33–40.

http://dx.doi.org/10.1016/j.cag.2015.12.002

[3] Taranta E, LaViola JJ. Penny pincher: a blazing fast, highly accurate $-family recognizer. In: Proceedings of graphics interface, 2015. p. 195–202.
[4] Vinayak V, Ramani K. Hand grasp and motion for intent expression in mid-air virtual pottery. In: Proceedings of graphics interface, 2015. p. 25–32.
[5] Liu Z, Zhang Y, Wu W, Liu K, Sun Z. Model-driven indoor scenes modeling from a single image. In: Proceedings of graphics interface, 2015. p. 25–32.
[6] Bera A, Kim S, Manocha D. Online parameter learning for data-driven crowd simulation and content generation. Comput Graph 2016;55:68–79.
[7] Sterling AB, Lin MC. Integrated multimodal interaction using texture representations. Comput Graph 2016;55:118–29.
[8] Zhang Y, Liu Z, Miao Z, Wu W, Liu K, Sun Z. Singe image-based data-driven indoor scenes modeling. Comput Graph 2015;53:210–23.
[9] Vinayak V, Ramani K. Extracting hand grasp & motion for intent expression in mid-air shape deformation: a concrete & iterative exploration through a virtual pottery application. Comput Graph 2016;55:143–56.
[10] Taranta E, González AV, LaViola JJ. Streamlined and accurate gesture recognition with penny pincher. Comput Graph 2016;55:130–42.



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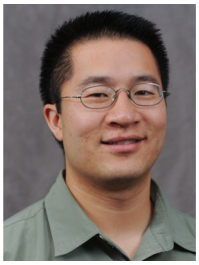

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