Pavol Klacansky

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Education

2015 - 2020 Computer Science PhD, University of Utah
advisors: Valerio Pascucci, Peer-Timo Bremer

2014 Artificial Intelligence BSc (Hons) Class 1, University of Leeds
project: Parallel Contour Tree Computation and Visualization
supervisor: Hamish Carr, assessor: Natasha Shakhlevich

Publications

[1] Hoang, D., Klacansky, P., Bhatia, H., Bremer, P.-T., Lindstrom, P., and Pascucci, V. A study of the trade-off between reducing precision and reducing resolution for data analysis and visualization. *IEEE Transactions on Visualization and Computer Graphics* (2019). to appear.

[2] Klacansky, P., Tierny, J., Carr, H., and Geng, Z. Fast and exact fiber surfaces for tetrahedral meshes. *IEEE Transactions on Visualization and Computer Graphics 23*, 7 (July 2017), 1782–1795.

[3] Usher†, W., Klacansky†, P., Federer, F., Bremer, P.-T., Knoll, A., Yarch, J., Angelucci, A., and Pascucci, V. A virtual reality visualization tool for neuron tracing. *IEEE Transactions on Visualization and Computer Graphics 24*, 1 (January 2018), 994–1003. † both first authors.

[4] Widanagamaachchi, W., Klacansky, P., Kolla, H., Bhagatwala, A., Chen, J., Pascucci, V., and Bremer, P. Tracking features in embedded surfaces: Understanding extinction in turbulent combustion. In *IEEE Symposium on Large Data Analysis and Visualization, LDAV 2015, Chicago, USA, 2015* (2015).

Projects

2017 - 2018 Useless Operating System (C, AMD64 assembly)
UOS is an exokernel that started as a class project for Advanced Operating Systems class and it had bootloader, 2 MiB pages, cooperative scheduling, and user mode "fork". After class I added preemption, user mode exceptions, and capability-based permissions.
https://klacansky.com/notes/useless-operating-system.html

2016 - 2017 Neuron Tracing in Virtual Reality (C++, GL, OpenVR)
We developed a tool that allows neuroanatomists to trace neurons faster directly in 3D. Throughout the project we collaborated with domain scientists from Moran Eye Center who provided us with data and helped us to develop and test the system.
My contribution was the tracing and navigation system, the replay system for inspecting the tracing sessions in VR, and the isosurface rendering along with GPU side of streaming.
https://store.steampowered.com/app/791040/Virtual_Reality_Neuron_Tracer/

2015 - 2017 Currypath (Haskell)
A ray tracer that uses REYES technique of splitting primitives during ray traversal. This approach allows to render pixel-perfect patches, such as bicubic Bezier or Catmull-Clark.
git://klacansky.com/currypath.git

2015 Fiber Surfaces (C, GL, Gtk+)
Fiber surface is a generalization of isosurface to multivariate data and this program allows interactive manipulation of fiber surfaces.
git://klacansky.com/fiber-surface.git

Experience

2018 — Summer Intern, Lawrence Livermore National Laboratory
built virtual metrology tool that allows inspection and taking measurements in VR

2017 — Summer Intern, Lawrence Livermore National Laboratory
created visualization tool to explore how different queries affect the streaming order of bits

2016 — Summer Intern, Lawrence Livermore National Laboratory
implemented new progressive merge tree algorithm
worked on local computation of merge trees for structured adaptive mesh refinement

2014 - 2015 — Research Assistant, School of Computing, University of Leeds
evaluated application of JCN to vector field topology
developed an exact fiber surface algorithm

2014 — Summer Intern, School of Earth and Environment, University of Leeds
scripted visualization of Earth's magnetic field in the core
submitted a patch to correct cartographic projection in VisIt

2013 — Summer Intern, School of Computing, University of Leeds
designed and implemented protocol for controlling Arduino with Kinect
combined vision algorithms for a navigation and collision detection for a Raspeberry Pi robot