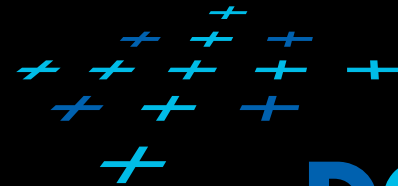


**DEPARTMENT OF
COMPUTER GRAPHICS
AND INTERACTION**



DCGI

**CZECH
TECHNICAL
UNIVERSITY
IN PRAGUE**



Background

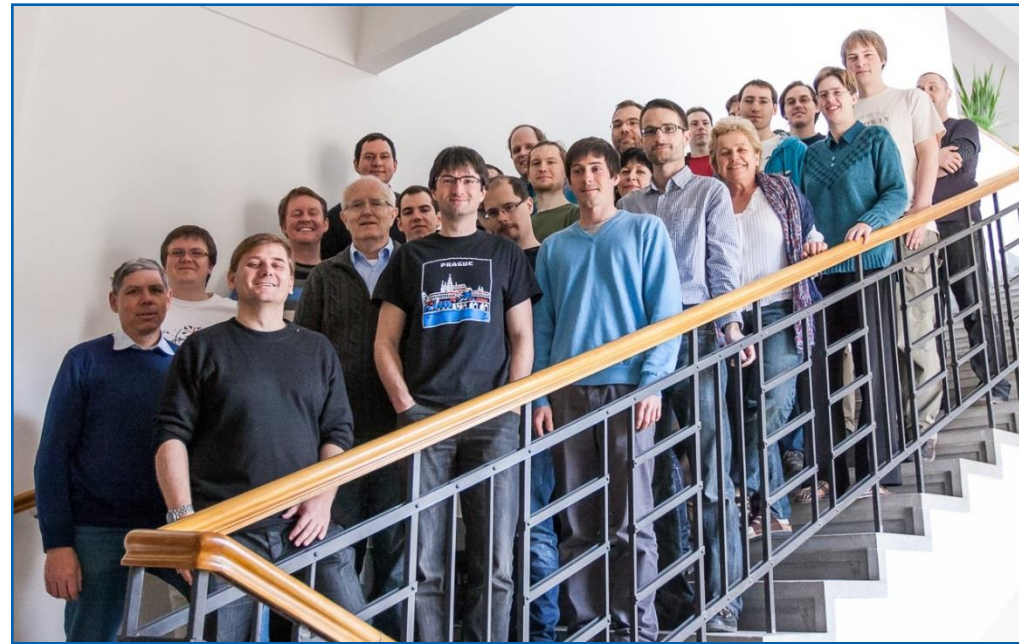
- Founded in 2008
- Part of Faculty of Electrical Engineering
- **Czech Technical University** in Prague



People & Collaborators

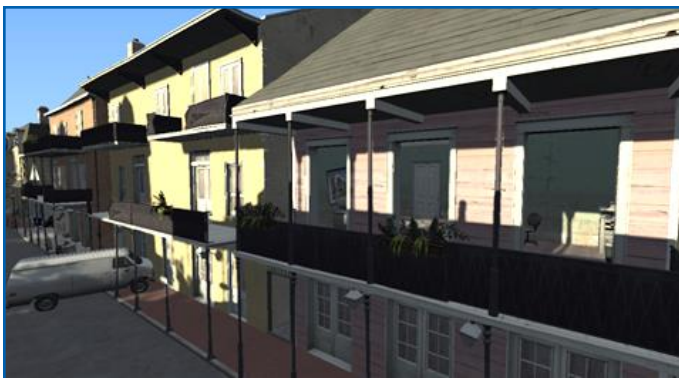
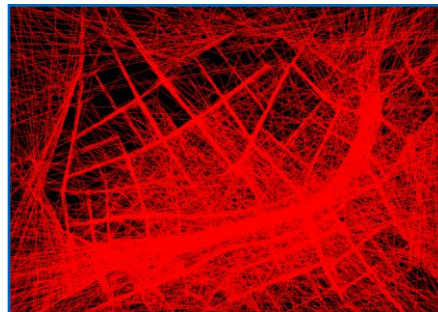


- Academic Staff [13]
- PhD students [10]
- Administration and Technical support [4]



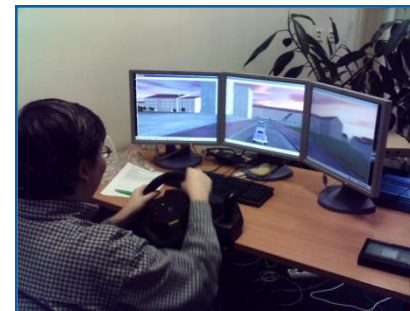
Computer Graphics

- Rendering
- Cartoon Animation
- Compression & Optimization



Human Computer Interaction

- Specialized interfaces
- Handicapped users
- User modeling and simulation



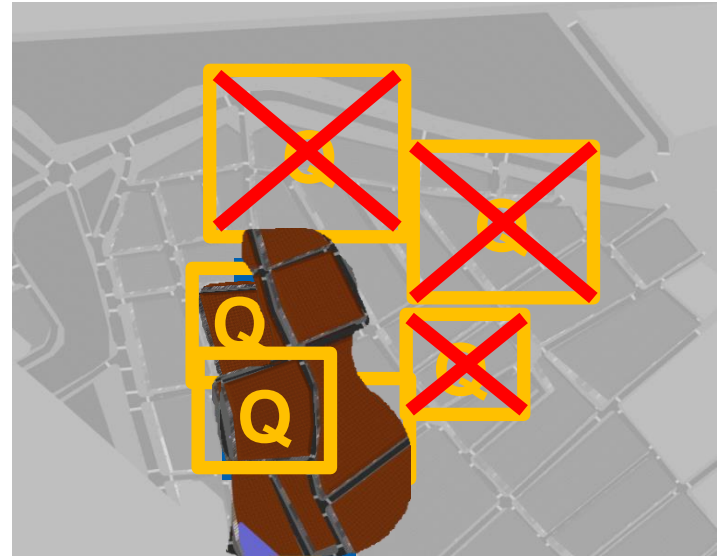
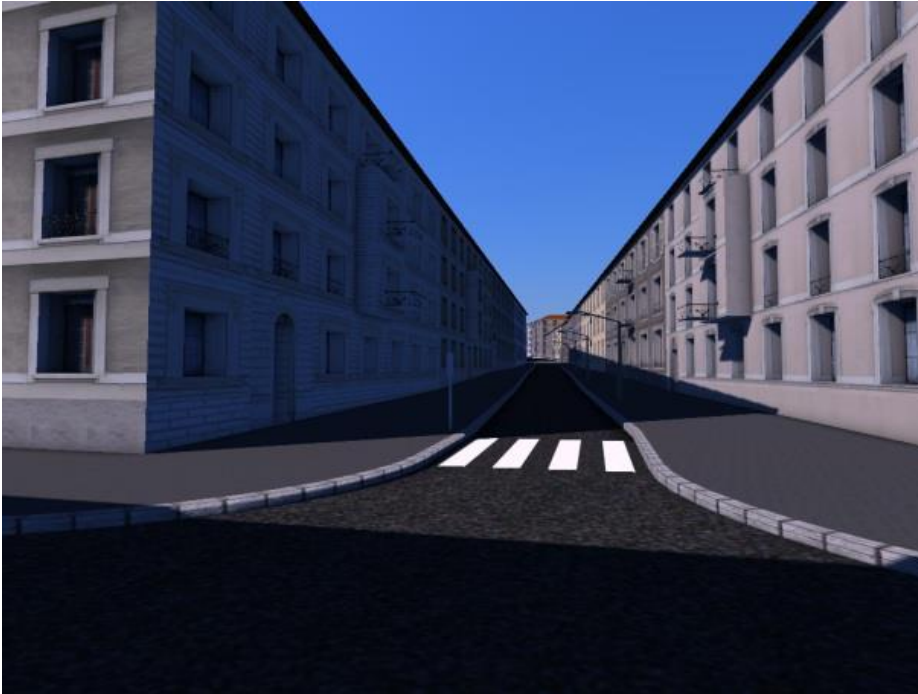
Real-Time Rendering - Visibility



Jiří Bittner, Oliver Mattausch, Peter Wonka, **Vlastimil Havran**, Michael Wimmer: ***Adaptive Global Visibility Sampling.*** SIGGRAPH 2009.

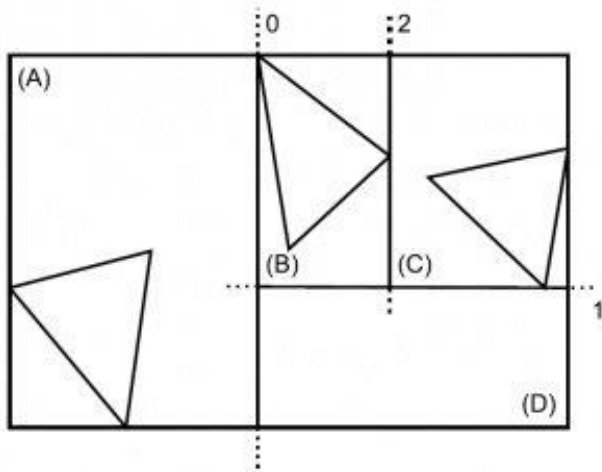


Real-Time Rendering - Shadows

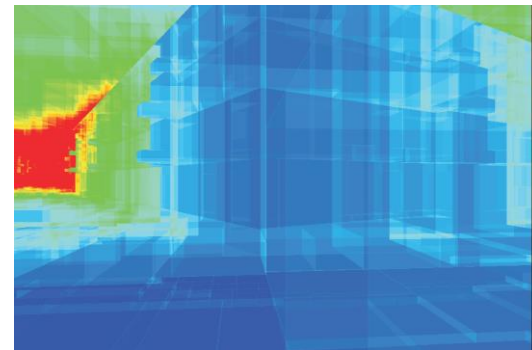
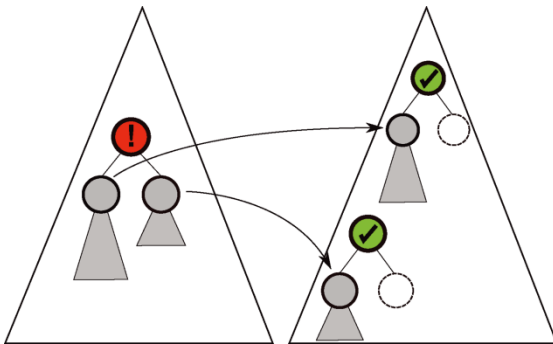


Jiří Bittner, Oliver Mattausch, Ari Silvennoinen, Michael Wimmer: *Shadow Caster Culling for Efficient Shadow Mapping*. I3D 2011.

Data Structures For Ray Tracing



Michal Hapala, Vlastimil Havran: *Review: Kd-tree Traversal Algorithms for Ray Tracing*. CGF 2011.



Jiří Bittner, Michal Hapala, Vlastimil Havran: *Fast Insertion-Based Optimization of Bounding Volume Hierarchies*. CGF 2013.

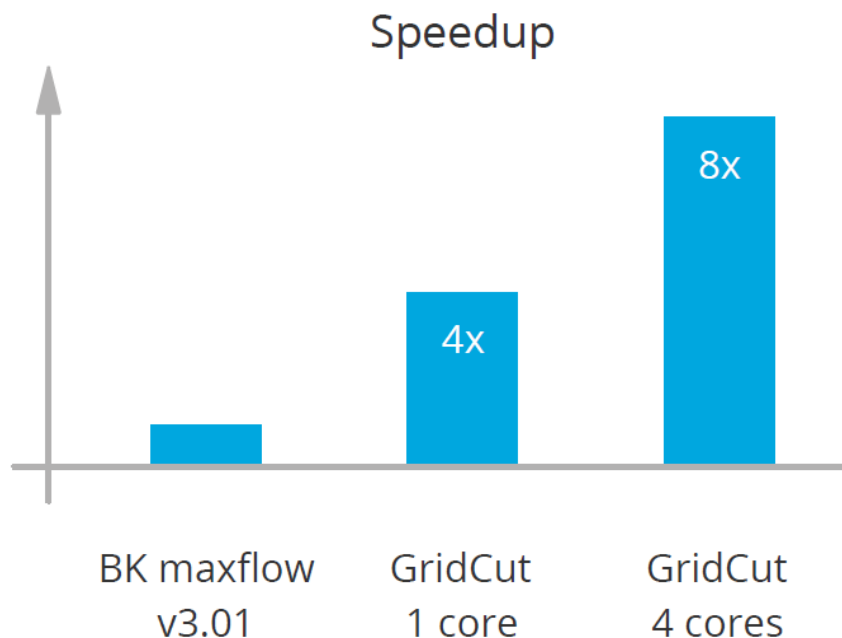
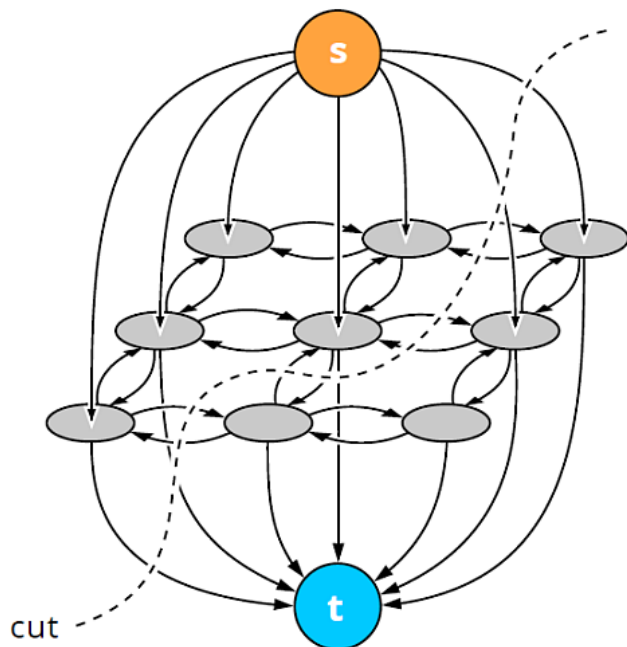


Sýkora et al.: *TexToons: Practical Texture Mapping for Hand-drawn Cartoon Animations*. NPAR 2011. **Best Paper Award.**



Vlastimil Havran, Jiří Filip, Karol Myszkowski:
***Bidirectional Texture Function Compression
Based on Multi-Level Vector Quantization.***
CGF 2010.

Optimization



Ondřej Jamriška, Daniel Sýkora, Alexander Hornung: *Cache-efficient Graph Cuts on Structured Grids*. CVPR 2012.

Resources for Researchers

- **Langweil model of Prague**
Scientific data available



<http://dcgi.felk.cvut.cz/en/research/langweil/main>

- **World's fastest max-flow/min-cut solver:**



GRIDCUT

Source code & Benchmark:
<http://gridcut.com>



Conclusion



- Thank you for your attention!

<http://dcgi.fel.cvut.cz>

Funding

- **ARGIE** (*Global Illumination for AR in General Environments*) – Grant Agency of CR (GA CR)
- **OPALIS** (*Optimal Algorithms for Image Synthesis*) – GA CR
- **V3C** (*Visual Computing Competence Center*) – Technology Agency of CR
- **VERITAS** – 7th FP EU
- **ToonPaint** – EU Marie Curie