David Kouřil

Nationality: Czech

Place of birth: Zlín (Czech Republic)

david.kouril@gmail.com

www.davidkouril.com

EDUCATION

Mar 2017 - Apr 2021: **Doctoral Degree** (Dr.techn.) @ TU Wien (AT)

- Thesis: “Interactive Visualization of Dense and Multi-Scale Data for Science Outreach”
- Highlight: IEEE Vis 2018 Best Paper Honorable Mention (SciVis)

Sep 2014 - Feb 2017: **Master's Degree** (Mgr.) @ Masaryk University (CZ)

- Field: Computer Graphics
- Thesis: "Maya2CellVIEW: Integrated Tool for Creating Large and Complex Molecular Scenes"

Sep 2011 - Jun 2014: **Bachelor's Degree** (Bc.) @ Masaryk University (CZ)

- Field: Computer Graphics and Image Processing
- Thesis: "Fast region labeling of binary images"

RESEARCH EXPERIENCE

Jul 2021 - now: **Postdoctoral Researcher** @ Masaryk University

- Investigating methods for visualization of three-dimensional chromatin structure
- Advising doctoral students at the visualization group VisitLab

Mar 2017 - Feb 2021: **Project Assistant** @ TU Wien

- Main researcher for 3 research projects
    - Labels on Levels: labeling for molecular scenes
    - HyperLabels: multi-scale navigation
    - Molecumentary: virtual tours of molecular models
- Provided support to students and external collaborators with the Marion library
- Collaborated with international experts from both visualization and biology domain

Jul 2016 - Feb 2017: **Project Assistant Without Degree** @ TU Wien

- Integrated several research prototypes into a unified demo which was then submitted to the VIZZIES challenge (organized by National Science Foundation)
- Ported a high-performance molecular rendering technique (cellVIEW) from DirectX to OpenGL for a new proprietary library (called Marion)

    - This code was later used in commercialization of the Marion library by a spin-off company Nanographics GmbH
- Implemented nano-scale rendering of microtubules for project contracted by Allen Institute For Cell Science

TALKS

HyperLabels: Browsing of Dense and Hierarchical Molecular 3D Models (conference paper presentation) @ IEEE Vis 2020, Salt Lake City (USA), October 2020 (given remotely). [recording]

Navigating and Exploring 3D Biological Environments (invited talk) @ Visualization II course, Masaryk University, Brno (CZ), April 2020 (given remotely).

Navigating and Exploring 3D Biological Environments @ CellVis Summit, KAUST (Saudi Arabia), November 2019. [recording]

Labels on Levels: Labeling of Multi-Scale Multi-Instance and Crowded 3D Biological Environments (conference paper presentation) @ IEEE Vis 2018, Berlin (DE), October 2018. [recording]

Challenges and advances in multi-scale biology data visualization (invited talk), Czech Technical University, Prague (CZ), November 2017.

COMMUNITY SERVICE

Reviewing: IEEE Vis 2018 (InfoVis), EuroVis 2019, CESCG 2019, IEEE TVCG (Jan2020, Apr2021), IEEE Vis 2020 (InfoVis, SciVis), IEEE Vis 2021, ISMAR 2021, EuroVis 2022

EuroVis 2018: Fast Forward Chair, Student Volunteer

TEACHING

TU Wien:

Computer Animation: Lab Assistant (SS 2018), Lecture on Hierarchical Animation and Motion Capture (SS 2017/2018)

Real-Time Visualization: Lab Assistant (WS 2017/2018/2019), Lecture on Fluid Simulation and Visualization (WS 2018/2019/2020)

Seminar: Supervisor (WS 2017/2018/2019/2020, SS 2018/2019/2020)

Theses Co-Supervision:

T. Koch: Semantic Screen-Space Occlusion for Multiscale Molecular Visualization (BA, started SS 2017, finished January 2018)
S. Haushofer: Molecular Dynamics using GPU skinning (BA, started SS2018, finished September 2018)

Masaryk University:

Computer Graphics APIs: Seminar lecturer

C Programming: Student advisor, preparation of a homework exercise

PUBLICATIONS

R. Alharbi, O. Strnad, L. R. Luidolt, M. Waldner, **D. Kouřil**, C. Bohak, T. Klein, E. Gröller, I. Viola, “Nanotilus: Generator of Immersive Guided-Tours in Crowded 3D Environments”, *IEEE Transactions on Visualization and Computer Graphics*, Early Access, accepted December 2021. Doi: 10.1109/TVCG.2021.3133592

D. Kouřil, O. Strnad, P. Mindek, S. Halladjian, T. Isenberg, M. E. Gröller, I. Viola, “Molecumentary: Adaptable Narrated Documentaries Using Molecular Visualization”, *IEEE Transactions on Visualization and Computer Graphics*, Early Access, accepted November 2021. Doi: 10.1109/TVCG.2021.3130670

H.-Y. Wu, A. Amirkhanov, N. Grossmann, T. Klein, **D. Kouřil**, H. Miao, L. R. Luidolt, P. Mindek, R. G. Raidou, I. Viola, M. Waldner, M. E. Gröller, “Visualization working group at TU Wien: Visible Facimus Quod Ceteri Non Possunt”, *Journal of Visual Informatics*, March 2021. Doi: 10.1016/j.visinf.2021.02.003

S. Halladjian, **D. Kouřil**, H. Miao, M. E. Gröller, I. Viola, T. Isenberg, “Multiscale Unfolding: Illustratively Visualizing the Whole Genome at a Glance”, *IEEE Transactions on Visualization and Computer Graphics*, Early Access, accepted February 2021. Doi: 10.1109/TVCG.2021.3065443

D. Kouřil, T. Isenberg, B. Kozlíková, M. Meyer, M. E. Gröller, I. Viola, “HyperLabels: Browsing of Dense and Hierarchical Molecular 3D Models”, *IEEE Transactions on Visualization and Computer Graphics*, Early Access, accepted February 2020. Doi: 10.1109/TVCG.2020.2975583

S. Halladjian, H. Miao, **D. Kouřil**, M. E. Gröller, I. Viola, T. Isenberg, "ScaleTrotter: Illustrative Visual Travels Across Negative Scales", *IEEE Transactions on Visualization and Computer Graphics*, 26(1):654-664, January 2020. Doi: 10.1109/TVCG.2019.2934334

H. Miao, T. Klein, **D. Kouřil**, P. Mindek, K. Schatz, M. E. Gröller, B. Kozlíková, T. Isenberg, I. Viola, “Multiscale Molecular Visualization”, *Journal of Molecular Biology*, 431(6):1049-1070, March 2019. Doi: 10.1016/j.jmb.2018.09.004

D. Kouřil, L. Čmolík, B. Kozlíková, H-Y. Wu, G. Johnson, D. Goodsell, A. Olson, M. E. Gröller, I. Viola, “Labels on Levels: Labeling of Multi-Scale Multi-Instance and Crowded 3D Biological Environments”, *IEEE Transactions on Visualization and Computer Graphics*, 25(1):977-986, January 2019. Doi: 10.1109/TVCG.2018.2864491

T. Koch, **D. Kouřil**, T. Klein, P. Mindek, I. Viola, “Semantic Screen-Space Occlusion for Multiscale Molecular Visualization”, *Eurographics Workshop on Visual Computing for Biology and Medicine*, 197-201, September 2018. Doi: 10.2312/vcbm.20181245

P. Mindek, **D. Kouřil**, J. Sorger, D. Toloudis, B. Lyons, G. Johnson, M. E. Gröller, I. Viola, “Visualization Multi-Pipeline for Communicating Biology”, *IEEE Transactions on Visualization and Computer Graphics*, 24(1):883-892, January 2018. Doi: 10.1109/TVCG.2017.2744518