

Dr. rer. nat.
Zdravko Velinov

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Work Experience

- 02/01/2021– **Senior R&D Programmer**, *Creative Assembly Sofia, SEGA Black Sea Ltd.*, Sofia, Bulgaria
Graphics engine, tools, shading work on Total War: Pharaoh. Fog and volumetrics (fog of war and settlement markers in campaign) along with editing tools, cloth simulation, in-house file format and FBX-based asset processing pipeline, shading, screen space shadows, SSR on curved surfaces, translucency, skin shading, 3ds Max and Maya exporter fixes for newer versions, terrain blending, cinematics tools enhancements, material and mesh variants editing tools enhancements, glints, wind system unification (rain, cloth, vegetation, particle system), grass shading sheens and translucency, skeleton remapping in animation system, dynamic weather, skybox warping, various fixes to water shading, shader generation tool enhancements and new nodes, animation system pose sharing optimizations, interactive water culling optimizations, general graphics engine maintenance.
Bug fixing, optimizations and minor features for Troy: A Total War Saga.
- 10/21/2020– **Senior Engine Developer**, *Ubisoft Sofia*, Sofia, Bulgaria
1/11/2021 Shadow mapping engine enhancements.
- 5/6/2019– **PH-R&D Postdoctoral Associate**, *Walt Disney Imagineering Research and Development, Inc.*
10/16/2020 *Disney Research Los Angeles*, Glendale, California, USA
Graphics algorithms R&D (volumetric fog, anti-aliasing) [2], AR/VR, previz, projection mapping [3].
- 1/16/2019– **Additional Programming**, *Haemimont Games AD*, Sofia, Bulgaria
3/8/2019 Skeletal animation compression, UI/font BC7 compression, UI and particle system fusing
- 6/1/2015– **PhD Researcher**, *University of Bonn*, Bonn, Germany
9/30/2018 Digital Material Appearance,
Appearance capture of human teeth [5]. Modeling of wave-optical glints under area light illumination [4] for real-time and offline rendering [6]. Appearance capture of pile fabrics and interactive tactile simulation [1].
- 7/1/2017– **Lab Associate/Intern**, *Disney Research Zurich*, Zurich, Switzerland
1/31/2018 Appearance capture of human teeth [5].
- 8/1/2015– **Additional Programming**, *Ivent Games*, Sofia, Bulgaria
3/12/2016 Porting rendering backend to D3D11.
- 11/1/2012– **Programmer**, *Haemimont Games AD*, Sofia, Bulgaria
5/30/2015 Graphics/Engine programming on Victor Vran and Tropico 5,
Graphics engine development and maintenance (particle systems, decals, deposition, SAO, SSR, culling, shading, graphics API backend, overlays, GUIs, render packet queuing, water, fog of war).

Education

- 6/1/2015–**PhD**, *University of Bonn*, Bonn, Germany
3/20/2019 Digital Material Appearance
Thesis submission date: 9/27/2018
Defense date: 3/20/2019
- 10/1/2012–**MSc**, *Technical University of Sofia*, Sofia, Bulgaria
2/7/2014 Telecommunications Engineering
- 9/15/2008–**BSc**, *Technical University of Sofia*, Sofia, Bulgaria
9/20/2012 Telecommunications Engineering
- 4/15/2012–**Erasmus**, *University of Twente*, Enschede, The Netherlands
8/31/2012 Erasmus exchange at Design and Analysis of Communication Systems Group
- 9/15/2003–**HSD**, *High School of Telecommunications*, Sofia, Bulgaria
6/20/2008 Telecommunications

Skills

- Computer Languages Advanced: C++11, C, GLSL, HLSL, PSSL
Moderate: Lua, CUDA, Python, ISPC, C#, JavaScript
- Game Engines Unity, UE4
- Deep Learning Tensorflow, Keras
- Graphics APIs Vulkan, OpenGL 4, Direct3D 11/12, PS4 Gnm, WebGL
- Tools Git, Perforce, SVN, Qt, Embree, CMake, OpenCV, Numpy, Ceres

Languages

- Fluent English (TOEFL iBT: 105)
- Mother Tongue Bulgaria
- Basic Russian

Video Game Credits

- 2023 Total War: Pharaoh
- 2021 Troy: A Total War Saga (Mythos DLC, Rhesus & Memnon DLC), Senior R&D Programmer
- 2019 Surviving Mars, Additional Programmers
- 2015 Victor Vran, Senior Programmers
- 2014 Tropico 5, Programmers

Journal Publications

- [2] Zdravko Velinov and Kenny Mitchell. "Collimated Whole Volume Light Scattering in Homogeneous Finite Media". In: *IEEE Transactions on Visualization and Computer Graphics* (2022).
- [4] Zdravko Velinov, Sebastian Werner, and Matthias B. Hullin. "Real-Time Rendering of Wave-Optical Effects on Scratched Surfaces". In: *Computer Graphics Forum* 37.2 (May 2018). ISSN: 1467-8659. DOI: 10.1111/cgf.13347.
- [5] Zdravko Velinov et al. "Appearance Capture and Modeling of Human Teeth". In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)* 37.6 (2018). ISSN: 0730-0301. DOI: 10.1145/3272127.3275098. URL: <https://doi.org/10.1145/3272127.3275098>.
- [6] Sebastian Werner et al. "Scratch Iridescence: Wave-optical Rendering of Diffractive Surface Structure". In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia)* 36.6 (Nov. 2017), 207:1–207:14. ISSN: 0730-0301. DOI: 10.1145/3130800.3130840. URL: <http://doi.acm.org/10.1145/3130800.3130840>.

Conference Publications

- [1] Zdravko Velinov and Matthias B. Hullin. "An Interactive Appearance Model for Microscopic Fiber Surfaces". In: *Vision, Modeling, and Visualization 2016*. Oct. 2016.

Patents

- [3] Zdravko Velinov, Kenny Mitchell, and Joseph G. Hager IV. *US Patent App. 16/885,172*. 2020.

Editor

2021– Associate Editor at ACM Games

Conference Committee

2021 i3D Program Chair
2020 i3D Posters Chair and Video Stream Production

Review

2021,2023 SIGGRAPH (Posters)
2021 Transactions on Graphics
2021 i3D Posters
2020 i3D Posters Chair
2020 SIGGRAPH (Papers)
2020,2023 Computer Graphics Forum
2019 Computers & Graphics
2018,2021,2022 SIGGRAPH Asia
2022 Eurographics

Cover Art

April 2018 "Cognitive Computing 2", Informatik-Spectrum, Volume 41, Issue 2, April 2018

Personal Awards

- February 2013 *Gold Medal Award*,
Graduating Bachelor's Degree with Highest Grades within Telecommunications Graduates in 2012
- January 2013 *Student Project Award*,
Bulgarian Association of Information Technologies
- February 2008 *First Place Award*,
National Programming Contest "Mlad Programist"

Shared Awards

- January 2016 Best Entertainment Software (Victor Vran),
Bulgarian Association of Information Technologies

Projects

- 2011–2019 **Tempest Renderer**
Research rendering framework. The main framework used in the wave-optical scratches and pile fabrics rendering projects. Used by self and colleagues at University of Bonn. Primary maintainer and creator.
- 2012–2014 **RCDCap**
Award winning application for wire-speed remote packet capturing and analysis on commodity hardware. It supports popular protocols for remote packet capturing (HP ERM, CISCO ERSPAN). Furthermore, the extensible architecture enabled the development of VLAN monitoring and rogue DHCP detection tools. Developed by self and used in thesis supervised by Rick Hofstede and Rositsa Goleva.