

# Curriculum vitæ – Oskar Elek

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## PERSONAL DATA

### Address:

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### Date of birth:

1<sup>st</sup> August 1987

### Citizenship:

Slovak Republic

### Marital status:

single



## EDUCATION

**2001–2005:** Gymnasium of Ľudovít Štúr, Zvolen, Slovakia

- graduation in May 2005

**2005–2008:** Bc. (BSc. equivalent) of Programming, at Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic (MFF UK)

- thesis topic: “Rendering Planetary Atmospheres in Real-Time” (supervised by Mgr. Petr Kmoch)

**2008–2011:** Mgr. (MSc. equivalent) of Software Systems, at Faculty of Mathematics and Physics, Charles University, Prague, Czech Republic (MFF UK)

- specialization: Computer Graphics
- thesis topic: “Physically-based Clouds Rendering on GPU” (supervised by Doc. Alexander Wilkie)
- finished *summa cum laude*

**2011–present:** Ph.D. in Computer Graphics, at Max Planck Institute for Informatics and MMCI Cluster of Excellence at Saarland University, Saarbrücken, Germany

- topic: Efficient physically-based rendering
- supervisors: Tobias Ritschel, Hans-Peter Seidel

## LANGUAGES

- English – full professional proficiency
- Slovak – mothertongue
- Czech – bilingual proficiency
- German, French – elementary proficiency

## PROFESSIONAL INTERESTS

Computer graphics (physically-based image synthesis aka rendering, participating media, light scattering, realistic materials appearance modelling, shading languages, volume rendering, GPU programming), computer games development, optics

## SKILLS

### Active technical skills:

- C/C++, OOP, GPU programming (Cg/HLSL/GLSL, DirectX/OpenGL, CUDA), realistic 3D image synthesis, SVN, L<sup>A</sup>T<sub>E</sub>X

### Passive technical skills:

- Java, RenderMan, user interfaces (WinAPI, Qt), HTML/CSS, compilers construction (Flex, Bison), non-procedural languages (Prolog, Haskell), Unix Shell

### Soft skills:

- experience with giving lectures and oral presentations
- managing a small team of programmers and external non-programmers, student supervision, etc.

- EMPLOYMENT
- Researcher at Max Planck Institute for Informatics (10/2011–present)
  - Tester at Bohemia Interactive Simulations (07/2010–08/2011)
  - Junior C++ Programmer at Laboratory Imaging Ltd. (07/2007–10/2008)
  - Math and physics tutoring (several secondary- and high-school students)
- CONFERENCE AND JOURNAL PUBLICATIONS
- Elek O, Bauszat P, Ritschel T, Magnor M, Seidel H-P: *Progressive Spectral Ray Differentials*, Proc. International Workshop on Vision, Modeling and Visualization (VMV), **2014**
  - Elek O, Ritschel T, Dachsbacher C, Seidel H-P: *Principal-Ordinates Propagation for Real-Time Rendering of Participating Media* (extended version), Computers and Graphics 45, **2014**
  - Elek O, Bauszat P, Ritschel T, Magnor M, Seidel H-P: *Spectral Ray Differentials*, Computer Graphics Forum (Proc. EGSR) 33(4) (Best Student Paper award), **2014**
  - Elek O, Ritschel T, Dachsbacher C, Seidel H-P: *Interactive Light Scattering with Principal-Ordinate Propagation*, Proc. Graphics Interface (Michael A. J. Sweeney Award: Best Student Paper), **2014**
  - Elek O, Ritschel T, Seidel H-P: *Real-Time Screen-Space Scattering in Homogeneous Environments*. IEEE Computer Graphics & Applications 33(3) (Special Issue “Scattering”), **2013**
  - Elek O, Ritschel T, Wilkie A, Seidel H-P: *Interactive Cloud Rendering Using Temporally-Coherent Photon Mapping* (extended version). Computers & Graphics 36(8), **2012**
  - Elek O, Ritschel T, Wilkie A, Seidel H-P: *Interactive Cloud Rendering Using Temporally-Coherent Photon Mapping*. Proc. Graphics Interface, **2012**
  - Elek O, Kmoch P: *Real-Time Spectral Scattering in Large-Scale Natural Participating Media*. Proc. Spring Conference on Computer Graphics, **2010**
- OTHER PUBLICATIONS
- Elek O: *Physically-based Cloud Rendering on GPU*, MSc thesis at MFF UK, **2011**
  - Elek O: *Layered Materials in Real-Time Rendering*. Proc. Central European Seminar on Computer Graphics (non peer-reviewed), **2010**
  - Elek O: *Rendering Parametrizable Planetary Atmospheres with Multiple Scattering in Real-Time*. Proc. Central European Seminar on Computer Graphics (non peer-reviewed), **2009**
  - Elek O: *Rendering Planetary Atmospheres in Real-Time*, BSc thesis at MFF UK, **2008**
- AWARDS AND HONOURS
- **2014**: Best Student Paper award at EGSR
  - **2014**: Michael A.J. Sweeney Award for Best Student Paper at Graphics Interface
  - **2011**: MSc. studies finished *summa cum laude*
  - **2010**: Best SCCG 2010 Presentation Award (based on public voting)
  - **2009**: Extraordinary studying results scholarship (academic year 2008/2009)
  - **2009**: Best CESC Paper Award (based on IPC voting)
  - **2009**: Best CESC Presentation Award (based on public voting)
- TEACHING
- Teaching assistant on “Interactive Global Illumination” advanced seminar (SS 2014 at Saarland University, Saarbrücken, lead by Tobias Ritschel)
- ACADEMIC ACTIVITIES
- **2014**: Reviewer for GRAPP
  - **2014**: Reviewer for Graphics Interface
  - **2014**: Reviewer for Eurographics (poster session)
  - **2013**: Reviewer for Graphics Interface
  - **2012**: Reviewer for Pacific Graphics
  - **2011**: Co-organization of the Eurographics Symposium on Rendering 2011 in Prague (student volunteer, photographer)
- PROJECTS
- HotEye simulation**, a commercial semi-research project developed for a private German company in collaboration with Saarland University Saarbrücken (UdS) and German institute for artificial intelligence research (DFKI)
- topic: development of a software simulation of an optical scanning system used for detection of mechanical and structural defects on steel cables used in civil engineering
  - team: 3 developers and one 3D modeller
  - role: design and development of the simulation, calculation and measurement of the physical properties of the real setup, development of auxiliary mathematical models, partial coordination of the team
  - developed over the course of 9 weeks in August and September 2010
  - the system successfully produces images which are qualitatively equivalent to those produced by the real scanner

**Flying Samurai**, a World War I combat flight simulator for the mandatory Software Project course at MFF UK

- supervised by: Otakar Nieder
- team: 4 programmers and several external contributors
- role: graphics programmer, joint team leadership with Jan Beneš and management of a part of the externs
- developed over the course of approximately 15 months from specification to hand-in (2009–2010)
- defended with extra ECTS credits in June 2010

**AtmoVision**, real-time planetary atmospheres renderer, accompanying application for my bachelor and master theses at MFF UK

- first version developed over the course of approximately 6 months (2007–2008)
- further developed for research purposes

PERSONAL  
INTERESTS

sports (skiing, cycling, running, swimming, skating, powerbocking), scientific literature, cinematography, photography, computer games

Saarbrücken, October 27, 2014