Raphael Menges

M.Sc.

✉ *raphaelmenges@uni-koblenz.de*
raphaelmenges.github.io
github.com/raphaelmenges
born 29th July 1991

Education

12/16–Today **PhD Student**, *University Koblenz-Landau*, Koblenz.
Institute for Web Science and Technologies

04/14–10/16 **Master**, *University Koblenz-Landau*, Koblenz, *Grade: 1.1*.
Computational Visualistics

04/11–03/14 **Bachelor**, *University Koblenz-Landau*, Koblenz, *Grade: 1.4*.
Computational Visualistics

08/02–03/11 **Abitur**, *Wilhelm-Hofmann-Gymnasium*, St.Goarshausen, *Grade: 1.5*.
General qualification for university entrance. Main subjects were Physics, Maths and English.

Master Thesis

Topic *Visualization of Molecule Surface Dynamics, Grade: 1.0.*

Supervisers Prof. Dr. Stefan Müller, M.Sc. Nils Lichtenberg

Abstact The surface of a molecule holds important information about the interaction behavior with other molecules. Amino acid residues with different properties change their position within the molecule over time. Some rise up to the surface and contribute to potential bindings. Other descent back into the molecular structure. Surface extraction algorithms are discussed and for the most appropriate one a highly parallel implementation is proposed. Layers of atoms are extracted by an iterative application of the algorithm. This allows one to track residues in their movement within the molecule in respect to their distance to the surface or core. Sampling of the surface is utilized for approximations of further values of interest, like surface area. Novel visualization methods are presented to support scientists in inspection of simulated molecule foldings. Atoms are colored according to their movement activity or an arbitrary group of atoms can be highlighted and analyzed. Proximity of residues to surface or core can be calculated over simulation time and allow conclusions about their contribution.

Bachelor Thesis

Topic *Interactive Ray-Casting of Volume Data, Grade: 1.0.*

Supervisers Prof. Dr. Stefan Müller, M.Sc. Gerrit Lochmann

Abstact This thesis covers the mathematical background of ray-casting as well as an exemplary implementation on graphics processing units, using a modern programming interface. The implementation is embedded within an editor, which enables the user to activate optimizations of the algorithm. Techniques like transfer functions and local illumination are available for a more realistic visualization of materials. Moreover, the user interface gives access to features like importing volumes, let one define a custom transfer function, holds controls to adjust parameters of rendering and allows to activate further techniques, which are also subject of discussion in this thesis. Benefit of all shown techniques is measured, whether it is expected to be visual or on the part of performance.

Projects

2018 **GazeTheWeb-Browse**, *Gaze-controlled Web browser*.
Web browser controlled by gaze. It is developed as part of the European project *MAMEM*. I work on it as part of my employment at the *Institute for Web Science and Technologies*. Interactive user interface elements are implemented using my *eyeGUI* library.

2015 **eyeGUI**, *Library to create user interfaces for eye tracking input*.
As employee of the *Institute for Web Science and Technologies* I am involved in the European project *MAMEM*. This project aims to enable people with loss of their voluntary muscular control to interact with computer systems. For this software project I have written a user interface library powered by modern OpenGL and C++11.

2015 **Schau genau!**, *Eye tracking arcade box for the* State Horticultural Show Landau 2015.
Initially unfinished product of a group project as part of my studies, Kevin Schmidt and I were employed to continue the work on this game. My tasks focused on visual arts and programming of the logic, gameplay and input interpretation. *Schau genau!* was successfully finished in March of 2015 and about 3000 participants played it during summer on the horticultural show without any known issues.

2015 **Collision avoidance for trucks with trailer**, *Student lab*.
Project as part of my studies which aimed to expand existing truck simulation software with a collision avoidance algorithm. I was group leader of the subgroup who integrated new components into the existing and poorly documented work group's software.

2014 **Votes!**, *Online voting system programmed with JavaEE 7*.
As project for a basic *Java Enterprise Edition* course, we programmed an online voting system in a group of three students. I was responsible for the business layer to connect Web application and database, but I spend also some work on the presentation layer.

2014 **Just Hot Air**, *Windows game featured in the United States and other countries*.
Game project for the modern *Windows* platforms by Andre Taulien, Michael Taenzer and me. My fields were the visual arts, the level design, game design and presentation. Over 40.0000 downloads on *Windows* and *Windows Phone* without any advertisement efforts.

2012 **Steoreo**, *Animation movie exploring the possibilities of the binocular view*.
Movie project with Arend Buchacher for the course *Aspekte der Bildgestaltung* as part of my studies. Was successfully presented at *CV-Tag 2012* in Koblenz.

2009 **TRE - Last Life**, *Total conversion of Unreal Tournament 3*.
Project with Andre Taulien before my studies. We had much experience with the Unreal Engine 3 at that time and decided to create a total conversion for Unreal Tournament 3, featuring a completely new single player game. I was responsible for the visual arts and level design. Our game was finalist in the last phase of *Make Something Unreal Contest* by *Epic Games* and *Intel*.

Teaching

Winter 17-18 **Data Mining and Machine Learning**, *Preparation of assignments and execution of tutorials.*.

Tutorials

During my studies, I gave tutorials supervised by Dr. Markus Lohoff. Each series consisted of 5 session, each 90 minutes. All topics and materials were prepared by myself.

Summer 15	**Blender and UDK**, *Asset creation for the new* Unreal Engine 4.
Winter 14-15	**Blender Game Engine**, *Creation of games using* the Blender Game Engine.
Summer 14	**Blender**, *Basics of modeling, modifiers, the* Cycles Renderer, *animation and compositing*.
Winter 13-14	**Basics of UDK**, *Level building, materials, visual programming and particles*.
Summer 13	**Game Modeling**, *Modeling, sculpting, painting and animation for games*.
Winter 12-13	**Basics of UDK**, *Levels, materials, scripting and particle systems*.
Summer 12	**Blender and UDK**, *Asset creation for* Unreal Development Kit *with* Blender.

Jobs

05/15–11/16	**Assistant**, *Developer of* eyeGUI *and* GazeTheWeb-Browse *as part of the* MAMEM *project*.
03/14–04/15	**Assistant**, *Working as developer on eye tracking arcade box* Schau genau!.
Winter 14-15	**Corrector**, *Corrections of* Algorithms and Datastructures *assignments by students*.
Winter 13-14	**Corrector**, *Corrections of* Algorithms and Datastructures *assignments by students*.

Languages

German	Native language
English	Good
Latin	Almost forgotten

Programming

C++	Advanced knowledge about cross-platform development, integration and creation of libraries and usage of the C++11 standard.
GLSL	Experienced shader constructor.
Java	Both standard and enterprise edition in version 7.
Python	Moderate knowledge.
Haskell	Basic knowledge.
Matlab	Basic knowledge.

Links

- Bachelor thesis download: `https://kola.opus.hbz-nrw.de/frontdoor/index/index/docId/809`
- Bachelor thesis software: `https://userpages.uni-koblenz.de/~raphaelmenges/Voraca`
- Computational Visualistics: `http://cv.uni-koblenz.de/`
- GazeTheWeb GitHub project: `https://github.com/MAMEM/GazeTheWeb`
- eyeGUI GitHub project: `https://github.com/raphaelmenges/eyeGUI`
- MAMEM project page: `http://www.mamem.eu`
- Schau genau! homepage: `http://schaugenau.west.uni-koblenz.de`
- Collision avoidance for trucks with trailer report: `https://owncloud.uni-koblenz-landau.de/owncloud/index.php/s/rhJLByf5eIXr60B`
- Just Hot Air IndieDB entry: `http://www.indiedb.com/games/just-hot-air`
- Steoreo homepage: `https://userpages.uni-koblenz.de/~raphaelmenges/steoreo`
- TRE - Last Life ModDB entry: `http://www.moddb.com/mods/tre-last-life`