

## Resume

I have worked full-time with Augmented & Virtual Reality since 2007, designing and implementing AR and VR applications with my focus being on 3D user interfaces, computer graphics, and computer vision. I have good connections within the international VR business and research communities, as I have regularly participated in VR conferences since 2011. I have taught a VR project course for 5 years in Aalto University, and supervised 5 research assistants in two of my own projects.

Currently I'm developing [RUIS](#), an open source VR toolkit aimed for prototyping experimental VR applications. My VR-themed [YouTube channel](#) has gathered over 200,000 views.

Specialties: virtual reality, augmented reality, software architecture, programming (C#, C/C++, Java), interaction design

## Personal information

Born in 1982 at Espoo, Finland.

## Languages

Native Finnish, fluent English, good Japanese, good German, satisfactory Swedish.

## Education

2017 Doctor of Science, Department of Computer Science, Aalto University.

Thesis: **A Toolkit for Virtual Reality Software Development**

2009 Master of Science in Technology, Department of Media Technology, Aalto University.

Thesis: **Optical Finger Tracking Using Color LEDs**

Grade average of all courses: 4.74 (max 5.0), graduated with honors.

## Work experience

- 2007 – present day, researcher in Aalto University Department of Media Technology, working with AR and VR applications, 3D user interfaces, and technologies behind them (motion tracking, sensor fusion, computer graphics). I also do teaching in courses with topics like VR, 3D animation, and user interfaces.
- 2006, research assistant: Summer job where I refactored the code of an existing virtual reality software platform at Helsinki University of Technology.
- 2005, research assistant: Summer job which included 3D model creation at Helsinki University of Technology.

## Invited speaker

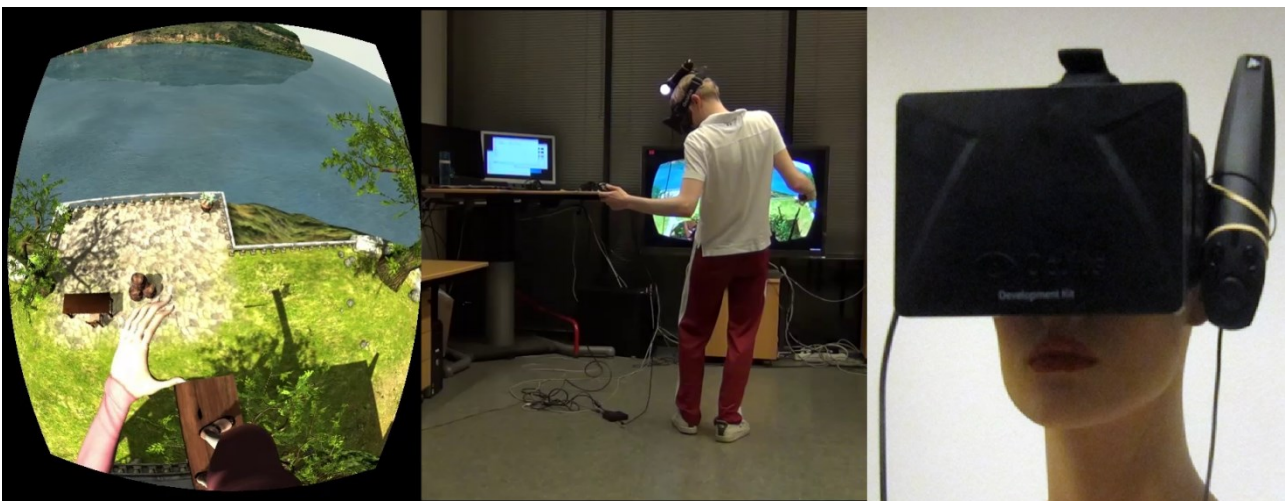
- Art & Virtual Reality event of ARS17 at Kiasma (2017) - Helsinki, Finland.
- ARTtech seminar at Assembly computer festival (2016) - Helsinki, Finland.
- AEC Hackathon 2.7 (2015) - Helsinki, Finland.
- Junction X Helsinki (2015) - Helsinki, Finland.

## ***Awards and acknowledgments***

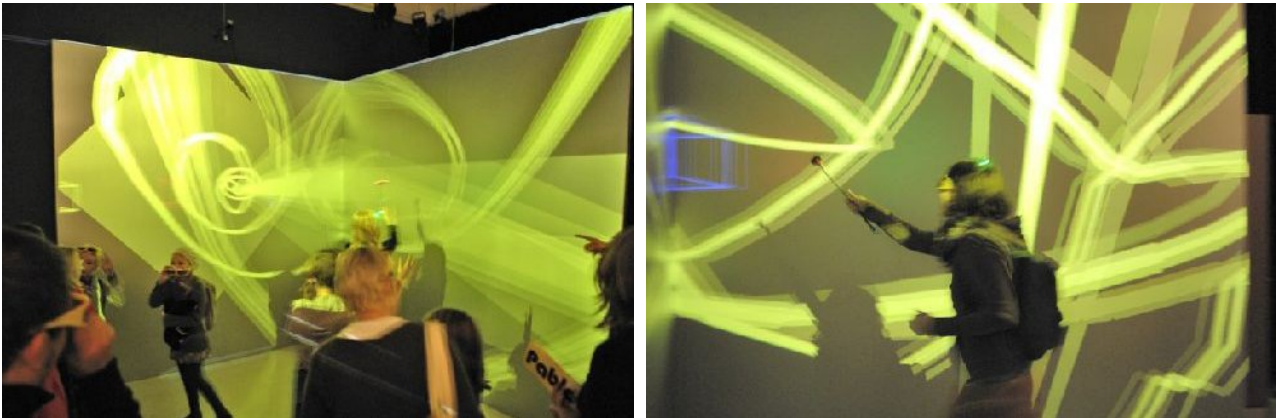
- 2016 Co-wrote an application that secured a 250,000 € grant to Finnish VR association (FIVR).
- 2013 Received a 5,000 € grant from Nokia Foundation.
- 2013 Chosen to participate in Aalto Entrepreneurship Society's ThinkBIG, a paid 2-week trip to Silicon Valley with some of the brightest students in Finland.
- 2013 Received 5,000 € funding from Aalto University's Media Factory for my [RUIS-project](#).
- 2013 Received a 10,000 € grant from The Research Foundation of Helsinki University of Technology.
- 2013 "[Best low-cost solution](#)" prize in the annual 3DUI contest at IEEE Symposium on 3D User Interfaces.
- 2012 Received a 40,000 € grant together with a colleague for an XP3D-UI research project.
- 2012 Received a 5,000 € grant from Emil Aaltonen foundation.
- 2011 Received a 7,000 € grant from Wihuri foundation.
- 2011 Received 20,000 € funding from Aalto University's Media Factory for my WeStyle-project.
- 2011 Received 13,000 € funding from Aalto University's Media Factory for my RUIS-project.
- 2010 Received a funded 4-year position in UCIT graduate school.
- 2005 3<sup>rd</sup> in Assembly'05 FastGFX competition.
- 2002 3<sup>rd</sup> in Assembly'02 Raytrace competition.
- 2001 1<sup>st</sup> in Assembly'01 Raytrace competition.

## ***Assorted works***

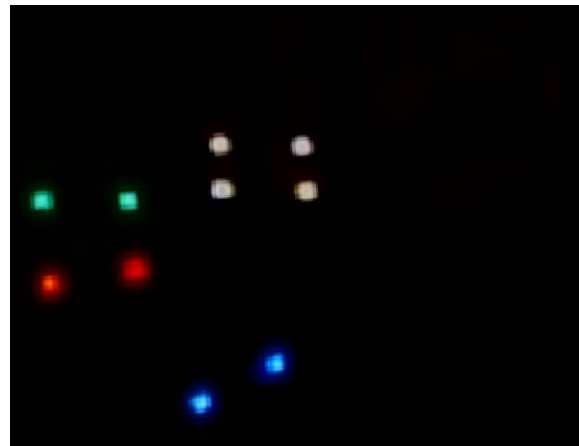
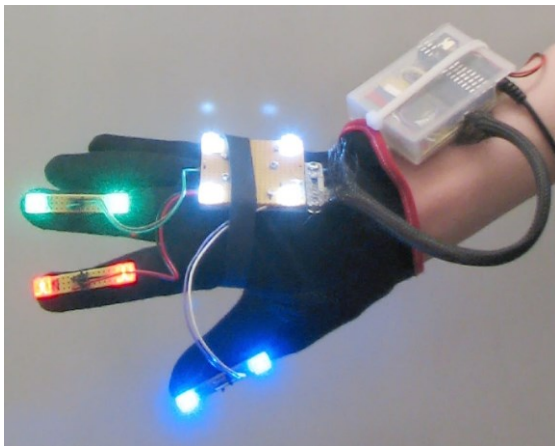
**Reality-based User Interface System (RUIS)**, 2011, ongoing research project: a platform that eases the adoption of new interaction technology. The goal of RUIS is to enable novice programmers to easily prototype applications with novel user interfaces. Introduction to RUIS-platform and demonstration videos can be found at [RUIS website](#).



**Picasso 3D Drawing**, 2009, an attraction at Annantalo museum's Picasso exhibition: The user can literally draw 3D virtual shapes into air, and view his artwork with stereo-glasses. My optical motion tracker (see HandsOn project below) is at the heart of this application.



**HandsOn**, 2007-2009, joint project of HUT, TTY, TaiK: My role included research about motion tracking, implementation of an optical tracker that uses distributed computing, and building a marker glove for it.



**3D Character Animation**, 2008, an attraction at Science Center Heureka's exhibition: The user uses stereo-glasses to view a virtual character, which can be manipulated through a wand-like interaction device. Creation of short keystone animation sequences is possible. Early version of my optical tracker was used in this project to provide tracking information to the main application.



**Virtual Dancer**, 2006, a university course project. YouTube video available at <http://youtu.be/gDfd1c4E6v8>



## Publications

- TM Takala, L Malmi, R Pugliese, T Takala  
**Empowering Students to Create Better Virtual Reality Applications: A Longitudinal Study of a VR Capstone Course**  
*Informatics in Education-An International Journal*, 15 (2), pp 287-317, 2016.
- FM Alonso, R Kajastila, TM Takala, M Matveinen, M Kytö, P Hämäläinen  
**Virtual ball catching performance in different camera views**  
*Proceedings of the 20th International Academic Mindtrek Conference*, ACM, 2016.
- TM Takala, P Hämäläinen, M Matveinen, T Simonen, J Takatalo  
**Enhancing Spatial Perception and User Experience in Video Games with Volumetric Shadows**  
*Computer-Human Interaction: Cognitive Effects of Spatial Interaction, Learning, and Ability*. Lecture Notes in Computer Science, Wyeld, Theodor; Calder, Paul; Shen, Haifeng (Eds.), Springer International Publishing, pp 91-113, 2015.
- TM Takala  
**RUIS – A Toolkit for Developing Virtual Reality Applications with Spatial Interaction**  
*Proceedings of the 2nd symposium on Spatial user interaction (SUI'14)*, Honolulu, HI, USA, October 4–5, 2014.
- TM Takala, M Matveinen  
**Full Body Interaction in Virtual Reality with Affordable Hardware**  
*Virtual Reality (VR)*, IEEE, Minneapolis, USA, March 29th-April 2nd, 2014.
- L Holsti, TM Takala, A Martikainen, R Kajastila, P Hämäläinen  
**Body-controlled trampoline training games based on computer vision**  
*CHI '13 Extended Abstracts on Human Factors in Computing Systems*, ACM, New York, 2013.
- TM Takala, M Mäkäräinen, P Hämäläinen  
**Immersive 3D modeling with Blender and off-the-shelf hardware**  
*IEEE Symposium on 3D User Interfaces 2013*, Orlando, USA, March 16th-17th, 2013.
- TM Takala, P Rauhamaa, T Takala  
**Survey of 3DUI Applications and Development Challenges**  
*IEEE Symposium on 3D User Interfaces 2012*, Orange County, USA, March 4th-5th, 2012.
- TM Takala, R Pugliese, P Rauhamaa, T Takala  
**Reality-based User Interface System (RUIS)**  
*IEEE Symposium on 3D User Interfaces 2011*, Singapore, March 19th-20th, 2011.
- J Kuusisto, TM Takala, O Korkalo, A Ellman, T Takala  
**Wearable haptic glove with McKibben actuators and optical tracking for virtual environments**  
*Proceedings of the 4th INTUITION international conference and workshop on virtual reality and virtual environments*, Athens, Greece, October 4-5, 2007.