

Tomislav Pejsa

Ph.D.

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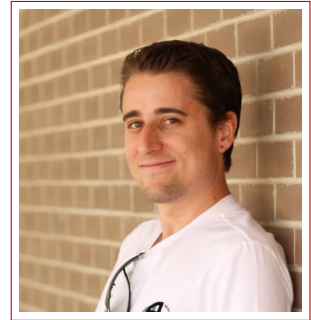
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GitHub: <https://github.com/tpejsa>

<https://github.com/uwgraphics/Leap>



Summary

Software engineer and researcher in computer graphics and human-computer interaction, specializing in:

1. 3D animation: animation engine architecture; animation techniques and algorithms; asset pipeline and tools; motion capture; motion retargeting; avatar animation
2. AR/VR application engineering: UI/UX engineering; AR/VR telepresence; avatar-based presence
3. Embodied conversational agents (ECAs): ECA system architecture; behavior synthesis; multimodal, multiparty interaction; physically situated interaction

Education

2016 **Ph.D. in Computer Science**, *Department of Computer Sciences, University of Wisconsin-Madison, USA.*

Advisors: Michael Gleicher, Bilge Mutlu

2007 **B.Sc. in Computing**, *Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia.*

Employment

Jan. **Senior Software Engineer**, *Magic Leap, Fort Lauderdale, FL, USA.*

2017–Present • Building magical experiences for the Magic Leap mixed-reality platform. Using Modern C++, GLSL, and in-house rendering and perception frameworks to write high-performance, interactive application components.

2011–2016 **Research Assistant**, *Department of Computer Sciences, University of Wisconsin-Madison, USA.*

• Invented new methods for synthesis of humanlike gaze motion, implemented using C# and Cg for the Unity platform: <https://git.io/viO0z>.

• Created a motion capture-based animation engine and graphical tool, written in C++ and utilizing OGRE and wxWidgets: <https://git.io/viO08>.

- Summer 2014 **Research Intern**, *Microsoft Research*, Redmond, WA, USA.
Natural Interaction Research Group (Supervisors: Hrvoje Benko, Eyal Ofek, Andrew Wilson)
- Invented Room2Room, an augmented-reality telepresence system. The system utilizes novel projection mapping technology in a room-scale setup with multiple color-depth cameras. Implemented using C# for the Unity platform: <http://y2u.be/tRzOqTRxoek>. Recipient of Best Paper Award at CSCW 2016.
- Spring 2014 **Research Intern**, *Microsoft Research*, Redmond, WA, USA.
Adaptive Systems and Interaction Group (Supervisors: Michael Cohen, Dan Bohus, Eric Horvitz)
- Worked on Monica, a virtual executive assistant system written in C#: <https://vimeo.com/107514035>.
- 2007–2011 **Research Assistant**, *Department of Telecommunications, Faculty of Electrical Engineering and Computing, University of Zagreb*, Croatia.
- Researcher and software engineer on visage|SDK, an animation toolkit built with C++ and OpenGL: <http://visagetechologies.com/>.

Publications

Books

- **Pejsa, T.** (2016). *Effective Directed Gaze for Character Animation* (Doctoral dissertation). University of Wisconsin-Madison.
- Pandzic, I.S., **Pejsa, T.**, Matkovic, K., Benko H., Cerekovic, A., and Matijasevic, M. (2011). *Virtualna Okruzenja: Interaktivna 3D Grafika i Njene Primjene*. [Virtual Environments: Interactive 3D Graphics and Its Applications.] Element, Zagreb, Croatia.

Journal Articles

- **Pejsa, T.**, Rakita, D., Mutlu, B., and Gleicher, M. (2016). Authoring Directed Gaze for Full-Body Motion Capture. *ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia 2016)*, 35(6), 161:1-161:11.
- **Pejsa, T.**, Andrist, S., Gleicher, M., and Mutlu, B. (2015). Gaze and Attention Management for Embodied Conversational Agents. *ACM Transactions on Interactive Intelligent Systems*, 5(1), Article 3, 34 pages.
- **Pejsa, T.**, Mutlu, B., and Gleicher, M. (2013). Stylized and Performative Gaze for Character Animation. *Computer Graphics Forum (Proceedings of EUROGRAPHICS 2013)*, 32(2), 143-152.
- **Pejsa, T.**, and Pandzic, I.S. (2010). State of the Art in Example-Based Motion Synthesis for Virtual Characters in Interactive Applications. *Computer Graphics Forum*, 29(1), 202-226.
- Cerekovic, A., **Pejsa, T.**, and Pandzic, I.S. (2009). A Controller-based Animation System for Synchronizing and Realizing Human-like Conversational Behaviors. *Development of Multimodal Interfaces: Active Listening and Synchrony, Lecture Notes in Computer Science*, 5967, 80-91.
- Brkic, M., Smid, K., **Pejsa, T.**, and Pandzic, I.S. (2008). Towards Natural Head Movement of Autonomous Speaker Agent. *Lecture Notes in Artificial Intelligence*, 5178(2), 73-80.

Full Conference Papers

- **Pejsa, T.**, Gleicher, M., and Mutlu, B. (2017). Who, Me? How Virtual Agents Can Shape Conversational Footing in Virtual Reality. *Intelligent Virtual Agents (IVA) 2017*, 347-359.
- **Pejsa, T.**, Kantor, J., Benko, H., Ofek, E., and Wilson, A.D. (2016). Room2Room: Enabling Life-size Telepresence in a Projected Augmented Reality Environment. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2016)*, San Francisco, CA. **Best Paper Award**.
- **Pejsa, T.**, Bohus, D., Cohen, M.F., Saw, C., Mahoney, J.M., and Horvitz, E. (2014). Natural Communication about Uncertainties in Situated Interaction. In *Proceedings of the 16th ACM International Conference on Multimodal Interaction (ICMI 2014)*, Istanbul, Turkey.
- Andrist, S., **Pejsa, T.**, Mutlu, B., and Gleicher, M. (2012). Designing Effective Gaze Mechanisms for Virtual Agents. In *Proceedings of the 30th ACM/SIGCHI Conference on Human Factors in Computing (CHI 2012)*, Austin, TX.
- **Pejsa, T.**, Pandzic, I.S. (2009). Architecture of an Animation System for Human Characters. In *Proceedings of the 10th International Conference on Telecommunications (ConTEL 2009)*, Zagreb, Croatia.

Short Conference Papers & Posters

- Rakita, D., **Pejsa, T.**, Mutlu, B., and Gleicher, M. (2015). Inferring gaze shifts from captured body motion. In *ACM SIGGRAPH 2015 Posters*, Los Angeles, CA.
- **Pejsa, T.** (2014). Authoring Communicative Behaviors for Situated, Embodied Characters. In *Proceedings of the 16th International Conference on Multimodal Interaction (ICMI 2014) Doctoral Consortium*, Istanbul, Turkey.
- Cerekovic, A., **Pejsa, T.**, and Pandzic, I.S. (2009). RealActor: Character Animation and Multimodal Behavior Realization System. In *Proceedings of the 9th International Conference on Intelligent Virtual Agents (IVA 2009)*, Amsterdam, The Netherlands.

Workshop Papers

- Andrist, S., **Pejsa, T.**, Mutlu, B., and Gleicher, M. (2012). A Head-Eye Coordination Model for Animating Gaze Shifts of Virtual Characters. In *Proceedings of the 4th Workshop on Eye Gaze in Intelligent Human-Machine Interaction held at the International Conference on Multimodal Interfaces*, Santa Monica, CA.

Skills

- C++, C, C#, Unity, Cg, GLSL, OpenGL
- Computer graphics; 3D animation; animation engine architecture; AR/VR application development; mobile application development
- 3D geometry; linear algebra; numerical methods; statistical data analysis

Languages

- English** Fluent, TOEFL iBT 119/120
- German** Intermediate, Deutsches Sprachdiplom (DSD) Stufe II
- Croatian** Native

Media Coverage

- MIT Technology Review: Augmented Reality Study Projects Life-Sized People into Other Rooms
- ZDNet: Microsoft's Skype Killer? Augmented Reality For Your Video Calls
- University of Wisconsin-Madison Science Narratives: Birth of the Bots

Teaching

University of Zagreb

<i>Term</i>	<i>Year</i>	<i>Course</i>	<i>Course Lead</i>
Fall	2010	Virtual Environments	Igor S. Pandzic
Fall	2009	Virtual Environments	Igor S. Pandzic
Spring	2009	Fundamentals of Virtual Environments	Igor S. Pandzic
Fall	2008	Virtual Environments	Igor S. Pandzic
Spring	2008	Fundamentals of Virtual Environments	Igor S. Pandzic
Fall	2007	Virtual Environments	Igor S. Pandzic

Professional Service

Program Committee Service

- AAMAS Conference, 2016: program committee member

Referee Service

- ACM Transactions on Graphics (TOG)
- AAMAS Conference
- ACM SIGGRAPH Conference
- Computer Animation & Virtual Worlds
- Eurographics Conference
- IEEE Transactions on Affective Computing
- Computer Graphics International (CGI) Conference
- International Conference on Intelligent Virtual Agents (IVA)
- Conference on Computer Animation and Social Agents (CASA)