

Curriculum Vitae (August 10, 2017)

Christoph Traxler, Dipl.-Ing. Dr. techn.

Born on 29th August 1966 in Vienna, Austria

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Short Bio

Christoph Traxler started his career as project assistant at the Institute of Computer Graphics and Algorithms, Vienna University of Technology. There he participated in various nationally and internationally funded projects, some of which he coordinated. In-between he worked for 2 years with CURE – Center for Usability Research and Engineering, University of Vienna and for another two years at Imagination Computer Services GmbH. Since October 2011 he is senior researcher at VRVis - Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH and since 2017 he leads the Geospatial Visualization group there. He is (co-)author of internationally refereed scientific papers and received the best paper award at ISMAR 2010. Since 1994 he is lecturer at Vienna University of Technology.

Education

1984 - 1986: Study of law at University of Vienna, - canceled.

1986 - 1993: Study of Computer Science at Vienna University of Technology.

1993: MS (Dipl.-Ing.) in Computer Science, thesis: "Ray Tracing von Fraktalen durch CSG-Automaten".

1993 – 1997: Doctoral program at Vienna University of Technology.

1997: PhD (Dr. techn.) in Computer Science from the Vienna University of Technology, PhD thesis: "Realistic Visualization of Natural Phenomenon with Cyclic CSG-Graphs".

Professional

Since 2017: Head of Geospatial Visualization at VRVis - Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH.

Since 2011: Senior researcher at VRVis - Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH.

2004 - 2011: Project assistant at the Institute of Computer Graphics and Algorithms (ICGA), Vienna University of Technology.

2002 - 2004: Scientific staff member of Imagination Computer Services GmbH., a spin-off company of ICGA. The position was funded by the FWF Impuls program.

- 1999 - 2002: Project assistant at the Institute of Computer Graphics and Algorithms (ICGA), Vienna University of Technology.
- 1999 - 2006: Coordinator of the international media art project Sunpendulum, www.sunpendulum.at.
- 1997 - 1999: Research assistant at CURE – Center of Usability Research and Engineering at the University of Vienna.
- 1993 – 1997: Research assistant at the Institute of Computer Graphics and Algorithms at Vienna University of Technology, funded by the Austrian Science Fund (FWF).

Projects

- Since 2017: CIMBIM and Surfaces (COMET, research on geospatial visualization, coordinator), www.vrvis.at/research/geospatial-visualization-group/.
- Since 2016: Mastcam-Z - Mars2020 Mastcam-Z 3D Vision (FFG Prodex, subcontractor), mars.nasa.gov/mars2020/mission/science/for-scientists/instruments/mastcam-z/.
- 2015 - 2016: HMC+ (COMET, coordinator), www.vrvis.at/research/projects/hmc/.
- 2013 - 2015: PRoViDE - Planetary Robotics Vision Data Exploitation (EU-FP7), www.provide-space.eu.
- 2013 – 2015: DOMUS – Down sampling of air pollution and weather models for urban scales (Wirtschaftsagentur Wien, formerly known as ZiT), www.ubimet.com/us/technology/research-development/domus/.
- 2012 - 2014: V-MANIP - Visualization and Manipulation of Multidimensional Data (ESA), deepenandlearn.esa.int/tiki-index.php?page=V-MANIP.
- 2011 - 2016: DSS - Decision Support System (COMET), www.vrvis.at/research/projects/dss/.
- Since 2011: ExoMars PanCam (FFG Prodex, subcontractor), www.vrvis.at/research/projects/exomars-pancam/.
- 2009 - 2013: RESHADE – Reciprocal Shading for Mixed Reality (FIT-IT, coordinator), www.cg.tuwien.ac.at/research/projects/RESHADE.
- 2006 – 2008: LEOPOLD - Lively Experience of the Past of Leopoldsberg from Digital Archaeological Data (WWTF, coordinator), www.cg.tuwien.ac.at/research/projects/LEOPOLD.
- 2005 – 2007: MARQ – Mobile Augmented Reality Quest (FWF TRP), studierstube.icg.tu-graz.ac.at/handheld_ar/marq.php.
- 2005 – 2006: U-CREATE (EU project FP6 - CRAFT).
- 2002 – 2004: Multi-User Interaktion in virtuellen Umgebungen (FWF Impuls).

2000 – 2002: ASH - Access to Scientific Space Heritage (EU project FP6).

Teaching

- 2014: QMAR2: Seminar on Mobile Mixed Reality for companies, funded by the FFG Qualification Seminars program.
- 2013: QMAR 1: Seminar on Mobile Mixed Reality for companies, funded by the FFG Qualification Seminars program.
- Since 1994: Lecturer of the course and lab “Fractals” at Vienna University of Technology (www.cg.tuwien.ac.at/courses/Fraktale/VO.html).

Languages

- German (native tongue)
- English (fluent)

Publications

- [1] Traxler C., Ortner T., Hesina G., Barnes R., Gupta S. and Paar G. The PRo3D View Planner – interactive simulation of Mars rover camera views to optimise capturing parameters. In Geophysical Research Abstracts, Vol. 19, EGU2017-18752, EGU General Assembly 2017, Vienna, Austria.
- [2] Barnes R., Gupta S., Gunn M., Paar G., Balme M., Huber B., Bauer A., Furya K., Caballo-Perucha M.P., Traxler C., Hesina G., Ortner T., Banham S., Harris J., Muller J.P. and Tao Y. Quantitative analysis of digital outcrop data obtained from stereo-imagery using an emulator for the PanCam camera system for the ExoMars 2020 rover. In Geophysical Research Abstracts, Vol. 19, EGU2017-14607, EGU General Assembly 2017, Vienna, Austria.
- [3] Balme M.R., Curtis-Rouse M.C., Banham S., Barnes D., Barnes R., Bauer A., Bedford C., Bridges J., Butcher F.E.G., Caballo P., Caldwell A., Coates A., Cousins C., Davis J., Dequaire J., Edwards P., Fawdon P., Furuya K., Gadd M., Get P., Griffiths A., Grindrod P.M., Gunn M., Gupta S., Hansen R., Harris J.K., Holt J., Huber B., Huntly C., Hutchinson I., Jackson L., Kay S., Kyberd S., Lerman H.N., McHugh M., McMahon W., Muller J-P., Paar G., Preston L.J., Schwenzer S., Stabbins R., Tao Y., Traxler C., Turner S., Tyler L., Venn S., Walker H., Wright J., Yeo-mans B. UK Space Agency “Mars Utah Rover Field Investigation 2016” (MURFI 2016). Overview of Mission, Aims and Progress. In Proceedings of 48th Lunar and Planetary Science Conference, The Woodlands, Texas, USA 2017.
- [4] Barnes R., Gupta S., Gunn M., Paar G., Huber B., Bauer A., Furya K., Caballo-Perucha M. P., Traxler C., Hesina G., Ortner T., Muller J. P., Tao Y., Banham S. G., Harris J., Balme M. Application of PRo3D to Quantitative Analysis of Stereo-Imagery Collected During the Mars Utah Rover Field Investigation (MURFI) Analogue Rover Trials. In Proceedings of 48th Lunar and Planetary Science Conference, The Woodlands, Texas, USA 2017.
- [5] Barnes R., Gupta S., Traxler C., Hesina G., Ortner T, Paar G., Huber B. PRo3D®: A tool for geological analysis of Martian rover-derived digital outcrop models. In Proceedings of 2nd Virtual Geoscience Conference, Bergen, Norway, 2016.

- [6] Paar G., Koeberl C., Hesina G., Huber B., Traxler C. 3D Vision for Mars 2020 Mastcam-Z: Pre-Assessment of Processing Techniques and Geologic Use Cases. In Proceedings of 47th Lunar and Planetary Science Conference, The Woodlands, Texas, USA 2016.
- [7] Traxler C., Hesina G., Barnes R., Gupta S., Paar G. The PROViDE framework for the quantitative geologic analysis of reconstructed Martian terrain and outcrops. In Geophysical Research Abstracts, Vol. 18, EGU2016-7196, EGU General Assembly 2016, Vienna, Austria.
- [8] Barnes R., Paar G., Traxler C., Muller J.P., Tao, Y., Sander K., Gupta S., Ortner T., Fritz L. PRO3D – Interactive Geologic Assessment of Planetary 3D Vision Data Products. In Proceedings of STRATI 2015, 2nd International Congress on Stratigraphy, Graz, Austria, 2015.
- [9] Paar G., Muller J.P., Tao Y., Pajdla T., Giordano M., Tasdelen E., Karachevtseva I., Traxler C., Hesina G., Tyler L., Barnes R., Gupta S., Willner K. PROViDE: Planetary Robotics Vision Data Processing and Fusion. In EPSC Abstracts, Vol. 10, EPSC2015-345, European Planetary Science Congress 2015.
- [10] Traxler C., Hesina G., Ortner T. and the PROViDE project team: PRO3D – a tool for remote exploration and visual analysis of multi-resolution planetary terrains. In EPSC Abstracts, Vol. 10, EPSC2015-23, European Planetary Science Congress 2015.
- [11] Barnes R., Gupta S., Giordano M., Morley J.G., Muller J. P., Tao Y., Sprinks J., Traxler C., Hesina G., Ortner T., Sander K., Nauschnegg B., Paar G., Willner K., Pajdla T. Geological interpretation and analysis of surface based, spatially referenced planetary imagery data using PROGIS 2.0 and Pro3D. In EPSC Abstracts, Vol. 10, EPSC2015-375, European Planetary Science Congress 2015.
- [12] Hecher M., Traxler C., Gerd H., Fuhrmann A., Fellner D.W. Web-based visualization platform for geospatial data. In proceedings of VISIGRAPP, the 10th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, pp. 311-316, Berlin, Germany 2015.
- [13] Traxler C., Paar G., Gupta S., Hesina G., Sander K., Barnes R., Nauschnegg B., Muller J.P. and Tao Y. A virtual environment for the accurate geologic analysis of Martian terrain. In Geophysical Research Abstracts, Vol. 17, EGU2015-10346-3, EGU General Assembly 2015, Vienna, Austria.
- [14] Paar G., Hesina G., Traxler C., Ciarletti V., Plettemeier D., Statz C., Sander K., Nauschnegg B. Embedding Sensor Visualization in Martian Terrain Reconstructions. In proceedings of ASTRA 2015, 13th Symposium on Advanced Space Technologies in Robotics and Automation, ESA/ESTEC, Noordwijk, the Netherlands 2015.
- [15] Paar G., Muller J. P., Tao Y., Tyler L., Traxler C., Hesina G., Gupta S., Huber B., Nauschnegg B. Fusion and Visualization of HiRISE Super-Resolution, Shape-from-Shading DTM with MER Stereo 3D Reconstructions. Poster for the AGU Fall Meeting, San Francisco, USA 2014.
- [16] Muller J. P., Tao Y., Sidiropoulos P., Yershov V., Morley J. G., Sprinks J., Paar G., Huber B., Bauer A., Willner K., Traxler C. European Geospatial Image Understanding Tools For Mars Exploration. In proceedings of the 8th International Mars Conference, Pasadena, USA 2014.

- [17] Tao Y., Muller J. P., Willner K., Morley J., Sprinks J., Traxler C., Paar G. 3D Data Products and Web-GIS for Mars Rover Mission for Seamless Visualisation from Orbit to Ground-level. In Proceedings of ISPRS - International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-4, 2014, pp.249-256.
- [18] Traxler C., Hesina G., Gupta S., Paar G., and the PROViDE Project Team: An Interactive Virtual 3D Tool for Scientific Exploration of Planetary Surfaces. In Geophysical Research Abstracts, Vol. 16, EGU2014-12038, EGU General Assembly 2014, Vienna, Austria.
- [19] Morley J., Sprinks J., Muller J.P., Tao Y., Paar G., Huber B., Bauer A., Willner K., Traxler C., Garov A., and Karachevtseva I. Contextualising and Analysing Planetary Rover Image Products through the Web-Based PROGIS. Geophysical Research Abstracts, Vol. 16, EGU2014-16013, EGU General Assembly 2014, Vienna, Austria.
- [20] Paar G., Muller J., Tao Y., Pajdla T., Morley J., Willner K., Karatchevtseva I., Traxler C., Hesina G., Tyler L., Barnes D. and Gupta S. PROViDE: Planetary Probes' Mass Vision Data Processing. In: Proceedings of European Planetary Science Congress (EPSC 2013), vol. 8, pp. 289-2.
- [21] Knecht M., Traxler C., Winklhofer C., Wimmer M. Reflective and Refractive Objects for Mixed Reality. *IEEE Transactions Visualization and Computer Graphics*, 19(4):576-582, March 2013.
- [22] Knecht M., Traxler C., Mattausch O., Wimmer M. Reciprocal Shading for Mixed Reality. *Computers & Graphics*, Vol. 36, Issue 7, pages 846-856, 2012.
- [23] Chmelina K., Hesina G., Traxler C. A 3-D Laserscanning system and scan data processing method for the monitoring of tunnel deformations. Extended version in the *Journal of Applied Geodesy*, 2012.
- [24] Knecht, M., Tanzmeister, G., Traxler, C., Wimmer, W. Interactive BRDF Estimation for Mixed-Reality Applications. In proceedings of the 20th WSCG International Conference on Computer Graphics, Visualization and Computer Vision, Plzen, Czech Republic, 2012.
- [25] Chmelina K., Jansa J., Hesina G., Traxler C. A 3-D Laserscanning system and scan data processing method for the monitoring of tunnel deformations, Joint International Symposium on Deformation Monitoring (2-4 November 2011, Hong Kong, China).
- [26] Martin Knecht, Christoph Traxler, Werner Purgathofer, Michael Wimmer. Adaptive Camera-Based Color Mapping For Mixed-Reality Applications. In Proceedings of the 2011 IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2011). October 2011.
- [27] Patrick Kührtreiber, Martin Knecht, Christoph Traxler. BRDF approximation and estimation for Augmented Reality. In proceedings of the 15th International Conference on System Theory, Control and Computing, pages 318-324, October 2011.
- [28] Martin Knecht, Andreas Dünser, Christoph Traxler, Michael Wimmer, Raphael Grasset. A Framework for Perceptual Studies In Photorealistic Augmented Reality. In proceedings of the 3rd IEEE VR 2011 Workshop on Perceptual Illusions in Virtual Environments, Singapore 2011.

- [29] M. Knecht, C. Traxler, O. Mattausch, W. Purgathofer and M. Wimmer. Differential Instant Radiosity for Mixed Reality. In the Proceedings of ISMAR 2010, Seoul 2010. **Best Paper Award.**
- [30] C. Traxler, W. Neubauer. The Harris Matrix Composer - A New Tool to Manage Archaeological Stratigraphy. In Digital Heritage, Proceedings of the 14th International Conference on Virtual Systems and Multimedia, pages 13-20. October 2008.
- [31] G. Zotti, C. Traxler. The ASH Virtual Reality Model of the Solar System (VRMoSS). In Proceedings of the Third IASTED International Conference on Visualization, Imaging, and Image Processing, pages 964-969. 2003.
- [32] K. Matkovic, Z. Szalavári, Christoph Traxler and Michael Gervautz. Virtual Gutenberg's Printing Press, ÖCGI Journal 21/1, pp. 33-37, 2002.
- [33] C. Traxler and M. Gervautz. Efficient ray tracing of complex natural scenes. Proceedings of Fractal 97, 4th International Multidisciplinary Conference, Denver, Colorado 1997. World Scientific Publishers, 1997.
- [34] C. Traxler, M. Gervautz. Using Genetic Algorithms to Improve the Visual Quality of Fractal Plants Generated with CSG-PL-Systems. In the proceedings of The Fourth International Conference in Central Europe on Computer Graphics and Visualization 1996.
- [35] M. Gervautz, C. Traxler. Representation and Realistic Rendering of Natural Phenomena with Cyclic CSG-Graphs. Visual Computer, Vol. 11, Springer-Verlag 1995.
- [36] C. Traxler, M. Gervautz. Calculation of tight bounding volumes for cyclic CSG-graphs. Proceedings of 11th Spring Conference on Computer Graphics, Bratislava, Slovakia, May 1995.

Reviews

ISMAR – International Symposium on Mixed and Augmented Reality: 2013, 2014.

IEEE Transactions on Visualization and Computer Graphics: 2015.

IEEE Virtual Reality: 2016, 2017.

VRST - ACM Symposium on Virtual Reality Software and Technology: 2017.