

Tomáš Pajdla

Curriculum Vitae

Business Address:

Czech Technical University in Prague
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Professional interests

Tomáš Pajdla was born in Prague, Czech Republic on May 10, 1969. In 1992, resp. in 2003, he received M.S. in Electrical Engineering at The Czech Technical University in Prague for the thesis *Geometric Model Construction from Sequences of Range Images*, resp. PhD. for the thesis *Stereo Geometry of Non-Central Cameras*. In 1994-1995, he spent one year at ESAT, Katholieke Universiteit, Leuven, Belgium where he worked at VISICS group. Since 1995, he is an assistant professor at the Department of Cybernetics of the Czech Technical University in Prague.

Tomáš Pajdla works on different aspects of computer vision. His experience includes visual robot control, eye-hand calibration and coordination, precise digital optical measurements, close and long range photogrammetry, and robot navigation using vision. His special interests include geometrical aspects of computer vision, among others, camera systems calibration, scene reconstruction from images, 3D data acquisition and processing, omnidirectional vision, and non-central cameras.

He most values his results: the generalisation of epipolar geometry to panoramic catadioptric cameras [3], the characterization of stereo correspondence surfaces of non-central cameras [18], and the invention of “the most non-central but nice stereo geometry” among all stereo geometries [4].

He is a lecturer of computer vision and robotics at the Department of Cybernetics. At the Center for Machine Perception, he participated, lead and leads a number of research projects funded by the Grant Agency of the Czech Republic, the Czech Ministry of Education, and by the European Union.

In 1996, he co-founded the spin-off company Neovision s.r.o. (www.neovision.cz), which specializes in industrial and medical applications of computer vision and image

processing techniques. He assisted at the development of a digital profile projector, optical recognition of Braille prints, and various inspection tasks using computer vision.

Tomáš Pajdla is a member of IEEE, ACM, and Czech Pattern Recognition Society. He published more than 50 scientific works in books, journals, and at reviewed prestigious conferences. In 1998 he was awarded ÖAGM Prize 1998 for the best paper [25] of ÖAGM Conference in Austria and in 2002 he received the prize for the best scientific paper at the British Machine Vision Conference 2002, for [13]. He was invited to give more than 10 invited lectures at various workshops, seminars, and conferences. In 2002 he has been offered by the scientific community to organize in Prague the ‘Eighth European Conference in Computer Vision 2004’, which is the most prestigious European conference in computer vision. He serves as a Programme Co-chair of the conference.

Personal Born in Prague, Czech Republic on May 10, 1969. Czech citizen. Uses actively Czech and English, passively Russian and German.

Education

1992 **MSc. (Ing.) in Electrical Engineering** at The Czech Technical University, Prague, Thesis: *Geometric Model Construction from Sequences of Range Images*

2003 **Ph.D. in Electrical Engineering** at The Czech Technical University, Prague, Thesis: *Stereo Geometry of Non-Central Cameras*

Professional experience

1996 **Co-founder** of the spin-off company **Neovision s.r.o.** which is specialized in computer vision applications for industry and medicine. Assisted at the development of a digital profile projector, optical recognition of Braille prints, and various inspection tasks using vision.

1995–now **Assistant Professor** at the Department of Cybernetics of the Czech Technical University, Prague. Research in 3D data acquisition and analysis, multi-view geometry, scene reconstruction from images, panoramic vision, and robot navigation.

1994–1995 **Research Assistant** at ESAT, Katholieke Universiteit, Leuven, Belgium. Research in computer vision at VISICS group. Worked on range data acquisition and 3D surface matching using invariance.

1987-1992 **Master student** at the Department of Control Engineering of the Czech Technical University, Prague. Research in 3D data acquisition, geometrical modeling, robot vision, eye-hand calibration and control.

Lecturing Computer Vision for Information Sciences at CTU Prague
Intelligent Robotics at CTU Prague

Research projects

2002-2005 Responsible investigator of *BeNoGo - "Being There - Without Going"*, EU Fifth Framework Programme project No. IST-2001-39184;

2003-2004 Responsible investigator of *Computational omnidirectional vision*, Czech Ministry of Education Kontakt 22-2003-04;

2001-2003 Responsible investigator of *OMVI - Omnidirectional Vision*, GACR No. 102/01/0971;

1997-2000 Responsible investigator of *OMNIVIEWS - Omni-directional Visual System*, EU Fifth Framework Programme project No. 1999-29017.

1999-2000 Responsible investigator of *OCAMS - Optimal Model Selection for 3D Data Segmentation*, Czech Ministry of Education 4/11/AIP CR;

1997-2000 Responsible investigator of *Construction of Complete 3D Models from Range Images*, GACR No. 102/97/0480;

1997-2000 Researcher of *Representation of 3-D Scene by 2-D Images*, GACR No. 102/97/0855;

1995-1998 Researcher of GACR 102/95/1278;

1995-1998 Researcher of *RECCAD - Reconstruction and Analysis of Complex Objects for Building CAD Models Based on Measured Data*, EU Copernicus No. 1068/94;

1993-1995 Researcher of *Reconstruction and modeling of 3D surfaces using active vision*, GACR 102/93/0954;

1993-1994 Researcher of *VIVA - Viewpoint Invariant Visual Acquisition*, ESPRIT BRA 6448;

1991-1992 Researcher of *IBM Academic initiative in the Czech Republic*, IBM C04;

Panoramic Vision : Sensors, Theory, and Applications, pages 85–114. Springer Verlag, Berlin, Germany, 1 edition, 2001.

Articles in Journals

- [2] Pavel Krsek, Tomáš Pajdla, and Václav Hlaváč. Differential invariants as the base of triangulated surface registration. *Computer Vision and Image Understanding*, 87(1–3):27–38, July 2002.
- [3] Tomáš Svoboda and Tomáš Pajdla. Epipolar geometry for central catadioptric cameras. *International Journal of Computer Vision*, 49(1):23–37, August 2002.
- [4] Tomáš Pajdla. Stereo with oblique cameras. *International Journal of Computer Vision*, 47(1-3), May 2002.
- [5] Tomáš Werner, Tomáš Pajdla, Václav Hlaváč, Aleš Leonardis, and Martin Matoušek. Selection of reference images for image-based representation. *Computing*, 2002.
- [6] Vladimír Smutný, Tomáš Pajdla, Václav Hlaváč, and Petr Palatka. Měření a inspekce s pomocí digitálního profilprojektoru. *Jemná mechanika a optika*, 44(3):72–73, March 1999.
- [7] Tomáš Pajdla, Václav Hlaváč, and Radim Šára. Segmentation of range images. *Acta Stereologica*, 13(2):459–464, June 1994.

Reviewed conferences

- [8] Branislav Mičušík, Daniel Martinec, and Tomáš Pajdla. 3d metric reconstruction from uncalibrated omnidirectional images. In *Proc. of the Asian Conference on Computer Vision (ACCV)*, page 7, Jeju Island, Korea, January 2004.
- [9] Doron Feldman, Tomas Pajdla, and Daphna Weinshall. On the epipolar geometry of the crossed-slits projection. In *ICCV 2003: Proceedings of the 9th International Conference on Computer Vision*, volume II, pages 988–995, 10662 Los Vaqueros Circle, P.O.Box 3014, CA 90720-1314, Los Alamitos, USA, October 2003. IEEE, IEEE Computer Society.
- [10] Branislav Mičušík and Tomáš Pajdla. Estimation of omnidirectional camera model from epipolar geometry. In *Proceedings of the Computer Vision and Pattern Recognition conference 2003*. IEEE Computer Society, June 2003.

- [11] Daniel Martinec and Tomáš Pajdla. Line reconstruction from many perspective images by factorization. In *Proceedings of the Computer Vision and Pattern Recognition conference 2003*. IEEE Computer Society, June 2003.
- [12] Daniel Martinec and Tomáš Pajdla. Consistent multi-view reconstruction from epipolar geometries with outliers. In *Proceedings of the 13th Scandinavian Conference on Image Analysis*, June 2003.
- [13] Branislav Mičušík and Tomáš Pajdla. Omnidirectional camera model and epipolar geometry estimation by ransac with bucketing. June – July 2003.
- [14] Giulio Sandini, José Santos-Victor, Tomáš Pajdla, and Fabio Berton. OMNIVIEWS: Direct omnidirectional imaging based on a retina-line sensor. In *First IEEE International Conference on Sensors*. IEEE, IEEE, June 2002.
- [15] Jiří Matas, Ondřej Chum, Martin Urban, and Tomáš Pajdla. Robust wide baseline stereo from maximally stable extremal regions. In Paul L. Rosin and David Marshall, editors, *Proceedings of the British Machine Vision Conference*, volume 1, pages 384–393, London, UK, September 2002. BMVA.
- [16] Daniel Martinec and Tomáš Pajdla. Structure from many perspective images with occlusions. In A. Heyden, G. Sparr, M. Nielsen, and P. Johansen, editors, *Proceedings of the ECCV'02*, volume II, pages 355–369, Berlin, Germany, May 2002. Springer-Verlag.
- [17] Tomáš Pajdla. Stereo with oblique cameras. In Bradski G.R and T.E Boulton, editors, *IEEE Workshop on Stereo and Multi-Baseline Vision*, pages 85–91, 10662 Los Vaqueros Circle, P.O. Box 3014, Los Alamitos, CA 90720-1314, USA, December 2001. IEEE Computer Society Press.
- [18] Hynek Bakstein and Tomáš Pajdla. 3D reconstruction from 360 x 360 mosaics. In *Proceedings of the CVPR'01 conference, to appear*, page 6, 2001.
- [19] Tomáš Werner and Tomáš Pajdla. Chirality in epipolar geometry. In *Proceedings of International Conference on Computer Vision*, pages 548–553. IEEE Computer Society Press, July 2001.
- [20] Tomáš Pajdla. Epipolar geometry of some non-classical cameras. In B Likar, editor, *Proceedings of Computer Vision Winter Workshop*, pages 223–233, Ljubljana, Slovenia, February 2001. Slovenian Pattern Recognition Society.
- [21] Martin Urban, Tomáš Pajdla, and Václav Hlaváč. Projective reconstruction from n views having one view in common. In Bill Triggs, Richard Szeliski, and Andrew Zisserman, editors, *Vision Algorithms: Theory & Practice*, LNCS, Berlin, Germany, September 2000. Springer.

- [22] Tomáš Pajdla and Václav Hlaváč. Zero phase representation of panoramic images for image based localization. In Franc Solina and Aleš Leonardis, editors, *8-th International Conference on Computer Analysis of Images and Patterns*, number 1689 in Lecture Notes in Computer Science, pages 550–557, Tržaska 25, Ljubljana, Slovenia, September 1999. Springer Verlag.
- [23] Tomáš Werner, Tomáš Pajdla, and Václav Hlaváč. Efficient rendering of projective model for image-based visualization. In *Proceedings of the 14th International Conference on Pattern Recognition, Brisbane, Australia*, pages 1705–1707, Los Alamitos, California, August 1998. International Association for Pattern Recognition, IEEE Computer Society.
- [24] Tomáš Pajdla and Václav Hlaváč. Camera calibration and Euclidean reconstruction from known observer translations. In *International Conference on Computer Vision and Pattern Recognition*, pages 421–426, Santa Barbara, California, USA, June 1998. IEEE.
- [25] Tomáš Svoboda, Tomáš Pajdla, and Václav Hlaváč. Epipolar geometry for panoramic cameras. In Hans Burkhardt and Neumann Bernd, editors, *the fifth European Conference on Computer Vision, Freiburg, Germany*, number 1406 in Lecture Notes in Computer Science, pages 218–232, Berlin, Germany, June 1998. Springer.
- [26] Tomáš Werner, Tomáš Pajdla, and Václav Hlaváč. Efficient 3-D scene visualization by image extrapolation. In Hans Burkhardt and Bernd Neumann, editors, *Proc. 5th European Conf. Computer Vision*, volume 2, pages 382–395, Berlin, Germany, June 1998. Springer Verlag.
- [27] Tomáš Werner, Tomáš Pajdla, and Václav Hlaváč. Oriented projective reconstruction. In M. Gengler, M. Prinz, and E. Schuster, editors, *Pattern Recognition and Medical Computer Vision: 22-nd Workshop of the Austrian Association for Pattern Recognition (ÖAGM/IAPR)*, pages 245–254, Wien, Austria, May 14–15 1998. Österreichische Computer Gesellschaft.
- [28] Tomáš Werner, Václav Hlaváč, Aleš Leonardis, and Tomáš Pajdla. Selection of reference views for image-based representation. In *Proceedings of the 13th International Conference on Pattern Recognition*, volume 1, pages 73–77, Vienna, Austria, August 1996. IEEE Computer Society Press, Los Alamitos, California.
- [29] Tomáš Pajdla and Luc Van Gool. Matching of 3-D curves using semi-differential invariants. In *5th International Conference on Computer Vision*, pages 390–395, Cambridge, USA, June 1995. IEEE Computer Society Press.

- [30] Václav Hlaváč, Tomáš Pajdla, and Miloš Sommer. Improvement of the curvature computation. In *Proceedings of the 12th International Conference on Pattern Recognition, Jerusalem, Israel*, volume 1, Computer Vision and Image Processing, pages 536–538. IEEE, October 1994.
- [31] Tomáš Pajdla and Václav Hlaváč. Surface discontinuities in range images. In *Fourth International Conference on Computer Vision, Berlin*, pages 524–528, Berlin, Germany, May 1993. IEEE Computer Society Press.

Seminars and Invited Lectures

- 2003* Omnidirectional Vision Course @ ICCV 2003 (<http://www.inrialpes.fr/lear/people/trig>)
Nice, October.
- 2002* The Hebrew University of Jerusalem, Israel, September
Aalborg University, Denmark, May
- 2001* Beijing Institute of Technology, Beijing, November
Chinese Academy of Sciences, Beijing, November
University of Ljubljana, Slovenia, September
Oxford University, Great Britain, July
ETH Zurich, Switzerland, April
- 2000* The Hebrew University in Jerusalem, Jerusalem, Israel, November
Technion, Israel Institute of Technology, Haifa, Israel, November
University of Ljubljana, Slovenia, August
3-D Structure from Images - SMILE'2000, Dublin, Ireland, July
- 1999* Vienna University of Technology, Vienna, Austria, October
Odense University, Odense, Denmark, July
University of Surrey, Guilford, UK, June
The University of Reading, Reading, UK, June
The University of Oxford, UK, June
Vitronic GmbH, Wiesbaden, Germany, March
- 1998* EVA'98, Electronic Imaging and the Visual Arts Conference, Berlin,
Germany, November
Workshop on Robot Perception for Autonomous Aerial Vehicles, Freiburg,
Germany, June
University of Iowa, Iowa City, U.S.A., August
Beckman Institute for Advanced Science and Technology, Urbana-
Champaign, U.S.A., August
University of Wisconsin, Madison, U.S.A., July
University of Freiburg, Freiburg, Germany, June
- 1997* University of Surrey, Guilford, Great Britain, November
University of Wisconsin, Madison, U.S.A., May
Milwaukee School of Engineering, Milwaukee, U.S.A., May

- 1996* Alternative Camera Technology Workshop, Sjaelands Odde, Denmark,
July
- 1995* Workshop on Computer Vision and Applied Geometry, Nordfjordeid,
Norway, August
- 1992* Seminar of IBM Academic initiative in the Czech Republic, Prague,
September

List of publications of Tomáš Pajdla