

Personal details

name: Pavel Mrázek
date of birth: March 2, 1972
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Education

1997 – 2001 Ph.D., Center for Machine Perception, Czech Technical University, Prague
◆ *doctoral state exam passed with honours in October 1999*
◆ *thesis "Nonlinear Diffusion for Image Filtering and Monotonicity Enhancement"*

1990 – 1996 Ing. (similar to M.Sc.) in computer science, Czech Technical University, Prague
◆ *thesis "Shape Model for Segmentation of Medical Data"*

Work experience, research fellowships

06/2004 – present biometric algorithm engineer, UPEK R&D Center, Prague
◆ *development of fingerprint recognition algorithms*

05/2004 researcher, Pattern Recognition Department,
Academy of Sciences of the Czech Republic, Prague
◆ *research topic: robust estimation and smoothing*

04/2002 – 03/2004 post-doc researcher, Faculty of Mathematics and Computer Science,
Saarland University, Germany
◆ *research topics: relations between nonlinear filters in digital image processing,
nonlinear diffusion, wavelet shrinkage, robust statistical estimation*
◆ *supervised student projects*

08/2000 – 03/2002 research fellow, Center for Machine Perception, Czech Technical University, Prague
◆ *main research topic: nonlinear diffusion for image filtering*
◆ *involved in teaching: Computer vision, Pattern recognition,
Computer algebraic systems, supervised student projects*
◆ *responsible for research demos and lab visits, organizer of reading groups*

02/2001 visiting researcher, Slovak Technical University, Bratislava, Slovakia
◆ *numerical methods for partial differential equations*

01 – 07/1999 visiting research student, CVSSP, University of Surrey, U.K.
◆ *human motion reconstruction from visual data, 3D geometry*

05/1998, 11/1999 visiting researcher, Fuzzy Logic Laboratory Linz-Hagenberg, Austria
◆ *precise measurement of metal sheets using computer vision techniques*

08 – 12/1998 application designer (part time), Neovision, Prague
◆ *design of computer vision applications, implementation in C*

Awards, grants

- 2001 Awarded by the rector of the Czech Technical University for outstanding achievements during the PhD studies.
- 2000 “Approximation and Noise Filtering Methods in Computer Vision”,
student grant of the Czech Technical University (principal investigator)
- 1999 “Processing of Uncertainty in Computer Vision”,
student grant of the Czech Technical University (principal investigator)
- 1997 – present participated in the projects
- ◆ “Mathematical methods for signal and image analysis”
(Priority program of the German research foundation)
 - ◆ “Theory and Application of Fuzzy Control” (funded by Aktion Austria–Czechia)
 - ◆ “Mathematical Models of Uncertainty” (Grant Agency of the Czech Republic)
 - ◆ “Center for Machine Perception” and “Center for Applied Cybernetics”
(Czech Ministry of Education)

Professional activities

- ◆ program committee member for European Conference on Computer Vision 2004,
Scale Space 2005
- ◆ reviewer e.g. for the conferences ICCV 2001 & 2003, ECCV 2002, Scale Space 2003,
DAGM 2003, VLSM 2003,
and for the journals IEEE Transactions on Image Processing,
IEEE Transactions on Medical Imaging,
Signal Processing,
Computational Statistics & Data Analysis,
International Journal of Pattern Recognition and Artificial Intelligence,
Journal of Computer Science and Technology

Skills

- Computer skills:
- ◆ programming (C, C++, Perl)
 - ◆ mathematical software (MATLAB, Maple)
 - ◆ \LaTeX
 - ◆ HTML
 - ◆ UNIX (Linux) and Windows environments

- Languages:
- ◆ Czech (mother tongue)
 - ◆ English (fluent)
 - ◆ German (advanced)
 - ◆ French (advanced)
 - ◆ Russian (intermediate)

Selected publications 2002 – 2005

Book chapters

- [1] T. Brox, R. van den Boomgaard, F. Lauze, J. van de Weijer, J. Weickert, P. Mrázek, and P. Kornprobst. Adaptive structure tensors and their applications. In J. Weickert and H. Hagen, editors, *Visualization and Processing of Tensor Fields*. Springer, Berlin, 2005. To appear.
- [2] P. Mrázek, J. Weickert, and A. Bruhn. On robust estimation and smoothing with spatial and tonal kernels. In R. Klette, R. Kozera, L. Noakes, and J. Weickert, editors, *Geometric Properties from Incomplete Data*. Kluwer, Dordrecht, 2005. To appear.
- [3] J. Weickert, G. Steidl, P. Mrázek, M. Welk, and T. Brox. Diffusion filters and wavelets: What can they learn from each other? In N. Paragios, Y. Chen, and O. Faugeras, editors, *Mathematical Models of Computer Vision: The Handbook*. Springer, Berlin, 2005. To appear.

Journal papers

- [4] P. Mrázek. Monotonicity enhancing nonlinear diffusion. *Journal of Visual Communication and Image Representation*, 13(1/2):313–323, March/June 2002.
- [5] P. Mrázek and M. Navara. Selection of optimal stopping time for nonlinear diffusion filtering. *International Journal of Computer Vision*, 52(2/3):189–203, May/June 2003.
- [6] P. Mrázek, J. Weickert, and G. Steidl. Diffusion-inspired shrinkage functions and stability results for wavelet denoising. *International Journal of Computer Vision*, 2005. To appear.
- [7] G. Steidl, J. Weickert, T. Brox, P. Mrázek, and M. Welk. On the equivalence of soft wavelet shrinkage, total variation diffusion, total variation regularization, and SIDes. *SIAM Journal on Numerical Analysis*, 42(2):686–713, 2004.

Conference papers

- [8] P. Mrázek, J. Weickert, G. Steidl, and M. Welk. On iterations and scales of nonlinear filters. In O. Drbohlav, editor, *Computer Vision Winter Workshop 2003*, pages 61–66. Czech Pattern Recognition Society, 2003.
- [9] P. Mrázek, J. Weickert, and G. Steidl. Correspondences between wavelet shrinkage and nonlinear diffusion. In L. Griffin and M. Lillholm, editors, *Scale-Space 2003*, volume 2695 of *LNCS*, pages 101–116. Springer, 2003.
- [10] P. Mrázek and J. Weickert. Rotationally invariant wavelet shrinkage. In B. Michaelis and G. Krell, editors, *Pattern Recognition. 25th DAGM Symposium, Magdeburg, Germany, September 2003*, volume 2781 of *LNCS*, pages 156–163. Springer, 2003.

Research reports

- [11] T. Brox, J. Weickert, B. Burgeth, and P. Mrázek. Nonlinear structure tensors. Technical Report 113, Saarland University, Department of Mathematics, 2004.

Full publication list and electronic versions of most papers are available online from <http://www.mia.uni-saarland.de/mrazek>.