

# Piotr DIDYK

## Curriculum vitae

### Personal Information

**Born:** June 2nd, 1984, Wałbrzych, Poland

**Citizenship:** Polish

### Work Experience

2014 – now **Cluster of Excellence on “Multimodal Computing and Interaction”, Saarland University, Independent Research Group Leader (W2)**, Saarbrücken, Germany.  
Head of the Perception, Display, and Fabrication Group

2014 – now **Max Planck Institute for Informatics, Senior Researcher**, Saarbrücken, Germany.

2012 – 2014 **Massachusetts Institute of Technology, Postdoctoral Associate**, Cambridge, MA, Advisor: Prof. Dr. Wojciech Matusik.

### Education

2008 – 2012 **Ph.D. (summa cum laude)**, Max Planck Institute for Computer Science/Saarland University, Saarbrücken, Germany, Supervisors: Prof. Dr. Hans-Peter Seidel & Prof. Dr-Ing. Karol Myszkowski.  
“Perceptual Display: Exceeding Display Limitations by Exploiting the Human Visual System”

2011 **Visiting Student**, Massachusetts Institute of Technology, Cambridge, MA, Advisor: Prof. Dr. Wojciech Matusik.

2007 – 2008 **Visiting Student**, Saarland University, Germany.

2003 – 2008 **M.Sc.**, University of Wrocław, Poland.

### Awards

2012 **Best Student Paper Award**, Human Vision and Electronic Imaging XVI, IS&T/SPIE.

2011 **Second Best Presentation Award**, 27th Spring Conference on Computer Graphics.

2007 **Fellowship awarded by Ministry of Science and Higher Education in Poland and Polish Academy of Science.**

### Research Summary

Interests: computer graphics, image and video processing, perception, new display technologies, computational fabrication

Journal articles	22	(9 × ACM Siggraph/TOG, 4 × ACM Siggraph Asia/TOG, 6 × Computer Graphics Forum)
Conference proceedings	8	
Courses	3	(1 × ACM Siggraph Asia, 2 × Eurographics)
Book Chapters	1	
Patents (including pending)	6	

## Teaching Experience

- 2016 **Computational Fabrication (full lecture)**, *Saarland University*.
- 2015 **Computational Display and Fabrication (seminar)**, *Saarland University*.  
Co-lecturer: Karol Myszkowski
- 2015 – 2016 **Perception in Computer Graphics (full lecture)**, *Saarland University*.  
Co-lecturers: Karol Myszkowski
- 2014 **Perception in Computer Graphics (full lecture)**, *Saarland University*.  
Co-lecturers: Karol Myszkowski, Tobias Ritschel
- 2013 **Computational Displays**, *Eurographics Tutorial*.  
Co-authors: Gordon Wetzstein, Douglas Lanman
- 2012 **Mapping Images to Target Devices: Spatial, Temporal, Stereo, Tone, and Color**, *Eurographics Tutorial*.  
Co-authors: Alessandro Artusi, Tunc O. Aydin, Francesco Banterle, Elmar Eisemann, Diego Gutierrez, Rafał Mantiuk, Tobias Ritschel
- 2011 **Multidimensional Image Retargeting**, *ACM SIGGRAPH Asia Course*.  
Co-authors: Alessandro Artusi, Tunc O. Aydin, Francesco Banterle, Elmar Eisemann, Diego Gutierrez, Rafał Mantiuk, Karol Myszkowski
- 2005 – 2006 **Tutor**, *Workshops preparing students for programming competitions*, University of Wrocław, Poland.

## Professional Activities

### Program Committees:

**ACM SIGGRAPH** Technical Papers Committee: 2015, 2016

**Eurographics** Short Papers Committee: 2014, 2015

**Eurographics** State-of-the-Art Reports Committee: 2017

**CAD/Graphics** Full Papers Committee: 2015

**International Workshop on Egocentric Perception, Interaction and Computing** Program Committee: 2016

**ACM SIGGRAPH Asia** E-Tech Prize Committee: 2014

### Reviewer:

ACM SIGGRAPH, ACM SIGGRAPH Asia, ACM Transaction on Graphics, ACM Transactions on Applied Perception, Eurographics, Pacific Graphics, Eurographics Symposium on Rendering, Computer Graphics Forum, IEEE Journal of Selected Topics in Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Visualization and Computer Graphics, IEEE Virtual Reality, IEEE Visualization and Graphics, Optics Letters, Optics Express, Computers and Graphics, Color Research and Application, The Visual Computer, Journal of Visual Communication and Image Representation, Computer Animation and Virtual Worlds, Spring Conference on Computer Graphics, Picture Coding Symposium, etc.

### Invited Talks:

- 2015 **Johannes Kepler University Linz**, *Austria*.
- 2014 **Tsinghua University**, *Beijing, China*.  
**University of Wrocław**, *Poland*.  
**Computational Photography and Visual Computing Workshop**, *Shenzhen, China*.
- 2013 **Bangor University**, *United Kingdom*.  
**International Conference on 3D Imaging**, *Toronto, Canada*.
- 2011 **Dolby Laboratories Inc.**, *Vancouver, Canada*.  
**Disney Research Lab Zürich/ETH Zürich**, *Switzerland*.

## Research Grants:

- 2015 – 2018 **Co-PI on “Perceptual-Aware Light Field Capture, Processing, and Display”**, joint collaboration between MPI Informatik and Fraunhofer IIS.
- 2017 **Adobe Systems Research Gift.**
- 2016 – 2017 **PI on “Perceptual Rendering for Immersive Displays”**, Intel Visual Computing Institute.

## Others:

- 2014 – now **Member of Ph.D. Admission Committee for the International Max-Planck Research School.**

## Patents

- Emulating displays with continuously varying frame rates**, Templin, K., Didyk, P., Myszkowski, K., and Seidel, H.-P., WO Patent Application (pending).
- Reducing view transitions artifacts in automultiscopic displays**, Du, S.-P., Didyk, P., Durand, F., and Matusik, W., WO Patent Application WO/2015/120032.
- Joint view expansion and filtering for automultiscopic 3D displays**, Didyk, P., Sitthi-Amorn, P., Freeman, W. T., Durand, F., and Matusik, W., US Patent Application US/2015/0124062.
- System and method for designing three-dimensional objects**, Chen, D., Sitthi-Amorn, P., Levin, D.I.W., Didyk, P., and Matusik, W., WO Patent Application WO/2014/210374.
- Methods and device for processing digital stereo image content**, Didyk, P., Ritschel, T., Eisemann, E., Myszkowski, K., and Seidel, H.-P., May 2011, WO Patent Application WO/2012/156518.
- Apparent display resolution enhancement for moving images**, Didyk, P., Eisemann, E., Ritschel, T., Myszkowski, K., and Seidel, H.-P., April 2010, WO Patent Application WO/2011/135052.

## Publications

### Journal Articles

- [1] Dunn, D., Tippets, C. A., , Torell, K., Kellnhofer, P., Aksit, K., Didyk, P., Myszkowski, K., Luebke, D., and Fuchs, H. Wide field of view varifocal near-eye display using see-through deformable membrane mirrors. *IEEE Transactions on Visualization and Computer Graphics (Selected Proceedings, IEEE Virtual Reality 2017, Los Angeles)*, 2017.
- [2] Kellnhofer, P., Didyk, P., Masia, B., Ritschel, T., Myszkowski, K., and Seidel, H.-P. Motion parallax in stereo 3D: Model and applications. *ACM Transactions on Graphics (Proceedings SIGGRAPH Asia 2016, Macao, China)*, 2016.
- [3] Piovarči, M., Levin, D. I., Rebello, J., Chen, D., Đurikovič, R., Pfister, H., Matusik, W., and Didyk, P. An interaction-aware, perceptual model for non-linear elastic objects. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2016, Anaheim, CA)*, 35(4):55, 2016.
- [4] Efrat, N., Didyk, P., Foshey, M., Matusik, W., and Levin, A. Cinema 3D: Large scale automultiscopic display. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2016, Anaheim, CA)*, 35(4):68, 2016.
- [5] Kellnhofer, P., Didyk, P., Myszkowski, K., Hefeeda, M. M., Seidel, H.-P., and Matusik, W. GazeStereo3D: Seamless disparity manipulations. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2016, Anaheim, CA)*, 35(4):68, 2016.
- [6] Templin, K., Didyk, P., Myszkowski, K., and Seidel, H.-P. Emulating displays with continuously varying frame rates. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2016, Anaheim, CA)*, 35(4):67, 2016.
- [7] Dąbala, Ł., Ziegler, M., Didyk, P., Zilly, F., Keinert, J., Myszkowski, K., Seidel, H.-P., Rokita, P., and Ritschel, T. Efficient multi-image correspondences for on-line light field video processing. *Computer Graphics Forum*, 35(7):401–410, 2016.

- [8] Calagari, K., Elgamal, T., Diab, K., Templin, K., Didyk, P., Matusik, W., and Hefeeda, M. Depth personalization and streaming of stereoscopic sports videos. *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, 12(3):41, 2016.
- [9] Templin, K., Didyk, P., Myszkowski, K., Hefeeda, M. M., Seidel, H.-P., and Matusik, W. Modeling and optimizing eye vergence response to stereoscopic cuts. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2014, Vancouver, Canada)*, 33(4), 2014.
- [10] Du, S.-P., Didyk, P., Durand, F., Hu, S.-M., and Matusik, W. Improving visual quality of view transitions in automultiscopic displays. *ACM Transactions on Graphics (Proceedings SIGGRAPH Asia 2014, Shenzhen, China)*, 33(6), 2014.
- [11] Templin, K., Didyk, P., Myszkowski, K., and Seidel, H.-P. Perceptually-motivated stereoscopic film grain. *Computer Graphics Forum (Proceedings Pacific Graphics 2014, Seoul, South Korea)*, 33(7):349–358, 2014.
- [12] Dąbala, L., Kellnhofer, P., Ritschel, T., Didyk, P., Templin, K., Myszkowski, K., Rokita, P., and Seidel, H.-P. Manipulating refractive and reflective binocular disparity. *Computer Graphics Forum (Proceedings Eurographics 2014, Strasbourg, France)*, 33(2), 2014.
- [13] Pająk, D., Herzog, R., Mantiuk, R., Didyk, P., Eisemann, E., Myszkowski, K., and Pulli, K. Perceptual depth compression for stereo applications. *Computer Graphics Forum (Proceedings Eurographics 2014, Strasbourg, France)*, 33(2), 2014.
- [14] Didyk, P., Sitthi-Amorn, P., Freeman, W. T., Durand, F., and Matusik, W. Joint view expansion and filtering for automultiscopic 3D displays. *ACM Transactions on Graphics (Proceedings SIGGRAPH Asia 2013, Hong Kong)*, 32:221:1–221:8, 2013.
- [15] Chen, D., Levin, D. I. W., Didyk, P., Sitthi-Amorn, P., and Matusik, W. Spec2Fab: A reducer-tuner model for translating specifications to 3D prints. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2013, Anaheim, CA)*, 32:135:1–135:10, 2013.
- [16] Masia, B., Wetzstein, G., Didyk, P., and Gutierrez, D. A survey on computational displays: Pushing the boundaries of optics, computation, and perception. *Computers & Graphics*, 37(8):1012–1038, 2013.
- [17] Didyk, P., Ritschel, T., Eisemann, E., Seidel, H.-P., Myszkowski, K., and Matusik, W. A luminance-contrast-aware disparity model and applications. *ACM Transactions on Graphics (Proceedings SIGGRAPH Asia 2012, Singapore)*, 31(5):184:1–184:10, 2012.
- [18] Templin, K., Didyk, P., Ritschel, T., Myszkowski, K., and Seidel, H.-P. Highlight microdisparity for improved gloss depiction. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2012, Los Angeles, CA)*, 31(4):1–5, 2012.
- [19] Didyk, P., Ritschel, T., Eisemann, E., Myszkowski, K., and Seidel, H.-P. A perceptual model for disparity. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2011, Vancouver, Canada)*, 30(4):96:1–96:10, 2011.
- [20] Didyk, P., Eisemann, E., Ritschel, T., Myszkowski, K., and Seidel, H.-P. Apparent display resolution enhancement for moving images. *ACM Transactions on Graphics (Proceedings SIGGRAPH 2010, Los Angeles, CA)*, 29(4):113:1–113:8, 2010.
- [21] Didyk, P., Eisemann, E., Ritschel, T., Myszkowski, K., and Seidel, H.-P. Perceptually-motivated real-time temporal upsampling of 3D content for high-refresh-rate displays. *Computer Graphics Forum (Proceedings Eurographics 2010, Norrköpping, Sweden)*, 29(2):713–722, 2010.
- [22] Didyk, P., Mantiuk, R., Hein, M., and Seidel, H.-P. Enhancement of bright video features for HDR displays. *Computer Graphics Forum (Proceedings Eurographics Symposium on Rendering 2008, Sarajevo, Bosnia and Herzegovina)*, 27(4):1265–1274, 2008.

## Conference Proceedings

- [23] Weier, M., Stengel, M., Grogoric, S., Roth, T., Eisemann, M., Eisemann, E., Kruijff, E., Magnor, M. A., Hinkenjann, A., Slusallek, P., Didyk, P., and Myszkowski, K. Perception-driven accelerated rendering. In *Eurographics 2017 – State of the Art Reports*, Lyon, France, 2017.
- [24] Gryaditskaya, Y., Masia, B., Didyk, P., Myszkowski, K., and Seidel, H.-P. Gloss editing in light fields. In *International Workshop on Vision, Modeling and Visualization*, 2016.
- [25] Calagari, K., Elgharib, M., Didyk, P., Kaspar, A., Matusik, W., and Hefeeda, M. Gradient-based 2D-to-3D conversion for soccer videos. In *Proceedings of the 23rd ACM International Conference on Multimedia*, pages 331–340. ACM, 2015.
- [26] Calagari, K., Templin, K., Elgamal, T., Diab, K., Didyk, P., Matusik, W., and Hefeeda, M. Anahita: A system for 3D video streaming with depth customization. In *Proceedings of the ACM International Conference on Multimedia, Orlando, Florida, USA*, pages 337–346, 2014.
- [27] Didyk, P., Ritschel, T., Eisemann, E., Myszkowski, K., and Seidel, H.-P. Apparent stereo: The Cornsweet illusion can enhance perceived depth. In *Human Vision and Electronic Imaging XVII, IS&T/SPIE's Symposium on Electronic Imaging*, pages 1–12, Burlingame, CA, 2012.
- [28] Templin, K., Didyk, P., Ritschel, T., Eisemann, E., Myszkowski, K., and Seidel, H.-P. Apparent resolution enhancement for animations. In *27th Spring Conference on Computer Graphics*, pages 85–92, Viničné, Slovak Republic, 2011.
- [29] Didyk, P., Ritschel, T., Eisemann, E., Myszkowski, K., and Seidel, H.-P. Adaptive image-space stereo view synthesis. In *Vision, Modeling and Visualization Workshop*, pages 299–306, Siegen, Germany, 2010.
- [30] Didyk, P., Eisemann, E., Ritschel, T., Myszkowski, K., and Seidel, H.-P. A question of time: Importance and possibilities of high refresh-rates. In *Visual Computing Research Conference*, 2009.

## Book Chapters & Courses

- [31] Wetzstein, G., Lanman, D., and Didyk, P. Computational displays. In *Eurographics 2013 Tutorials*, May 2013.
- [32] Didyk, P., Ritschel, T., Eisemann, E., and Myszkowski, K. *Perceptual Digital Imaging: Methods and Applications*, chapter Exceeding Physical Limitations: Apparent Display Qualities. CRC Press, 2012.
- [33] Banterle, F., Artusi, A., Aydin, T., Didyk, P., Eisemann, E., Gutierrez, D., Mantiuk, R., and Ritschel, T. Mapping images to target devices: Spatial, temporal, stereo, tone, and color. In *Eurographics 2012 Tutorials*, May 2012.
- [34] Banterle, F., Artusi, A., Aydin, T., Didyk, P., Eisemann, E., Gutierrez, D., Mantiuk, R., and Myszkowski, K. Multidimensional image retargeting. In *ACM SIGGRAPH Asia 2011 Courses*. ACM, December 2011.