



Fan ZHANG

An experienced UX researcher with solid multi-disciplinary backgrounds in psychophysics, robotics, and engineering.

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Research Experience

12/18-
present

Procter & Gamble
Delft University of Technology
UX Researcher Fellow

Germany
The Netherlands

As the external research fellow at the Industrial Design Engineering Faculty (prof. Sylvia Pont) for Procter & Gamble (Consumer Market Knowledge).

- Aim: to measure and model user's visual-tactile experience on certain products under different lighting
- Achievements:
 - product dependent effects of lightings and shapes
 - correlations between certain video features and the perceived ratings of the selected attributes
 - translate perceptual data into the selected physical attributes in product design
 - practical guidelines for improving the empirical product design process
- Methods:
 - Setup psychophysical experiments and test students from the university and real consumers recruited by the company as human subjects for comparison
 - Manipulate both visual and tactile information of the product by varying lighting and shape in the photographs and videos as the stimuli

11/13-
11/18

Delft University of Technology The Netherlands
Human Information Communication Design Section, Industrial Design Department
Ph.D. in Perceptual Intelligence - Visual Perception

EU Marie-Curie ITN (FP7) with Prof. Sylvia Pont and Prof. Huib de Ridder

- An EU-founded research and training network – Perceptual Representation of Illumination, Shape & Material ([PRISM](#)), collaborating with industries, e.g. Philips.
- Aim: to measure and model user's visual experience on material appearance, and understand the influence of lighting.
- Achievements:
 - Develop a novel probing method to quantitatively measure user's visual perception of material and lighting
 - Interpret user data into intuitive understandings for visual perception and design
 - Mapping physical properties and associated human perceptual judgements
 - Identify optical cues that trigger human visual perception of material qualities
- Research method:
 - Psychophysical experiments using novel interactive interfaces
 - Image processing for datasets of scenes varying parametrically
 - Image processing for identifying the sensory cues
 - Optics-based computational modelling of canonical lighting and material modes
 - Data analysis for multivariate statistics in visual perception
- Close work relations with UX designers and human-computer interaction designers

Education

- 09/12-09/13 **King's College London** UK
M.Sc. in Robotics
- Graduate with **Distinction**
 - **Focus:** Computer Vision/Machine Learning
 - **Thesis:** *A Neural Network for Solving the Stereo Correspondence Problem.* I developed a stereovision version of an existing neural network model of primary visual cortex cells, implemented the model on simple artificial scenes and complex realistic scenes.
 - **Core Courses:** Artificial Intelligence, Computer Vision, Computer-aided Manufacturing and Design, Pattern Recognition, Real-Time Systems and Control, Robotics Systems, Sensors and Actuators
- 09/07-07/11 **Shanghai Jiao Tong University** China
B.Eng. in Mechanical Engineering and Automation
Chinese-English Bilingual Program
- **Focus:** Computer-aided Manufacturing and Design
 - **Thesis:** *The Identification of Tool Cutting Condition Based on AE (Acoustic Emission) Signal.* I participated in building hardware and software platforms for receiving and processing the AE signal to identify specific tool conditions in manufacturing processes.

ADDITIONAL PROJECTS AND COLLABORATIONS

- 04/16-11/18 **Visual optimization for material appearance** France
Hosted by [Dr. Pascal Barla](#) at INRIA Bordeaux Sud-Ouest
- Aim: to improve user's visual experience on materials by providing optimal lighting
 - Achievements:
 - Develop prototypes of canonical material and lighting modes using optics-based computational models
 - Develop a protocol to test complex material-lighting interactions
 - Validate predictions of lighting effects on materials
 - Publications in peer-reviewed journals
- 02/15-05/15 **Prototyping and experiment** Germany
Hosted by [Prof. Roland Fleming](#) at University of Giessen
- Develop prototypes of canonical material modes using 3D modelling and rendering technique
 - Experimental design for testing glossiness perception in a project collaborating with a local car coating company CARL SCHLENK AG.

PROFESSION SKILLS

Programming: MATLAB, R, SPSS, OpenGL(GLSL)
Design and Engineering: Photoshop, 3D modelling/rendering software such as Blender, MaxwellRender, AutoCAD, etc.
Language: Mandarin Chinese (native); English (proficient)

PUBLICATION LIST

- Journal Paper **Effects of light direction and shape on the visual perception of canonical materials.**
Zhang, F., de Ridder, H., Barla, P., & Pont, S. (under revision).
Submitted to peer-reviewed journal for publication.
- A systematical approach to testing and predicting light-material interactions.**
Zhang, F., de Ridder, H., Barla, P., & Pont, S. (2019).
Journal of Vision, 19(4), 1-22. doi:10.1167/19.4.11
- Asymmetric perceptual confounds between canonical lightings and materials.**
Zhang, F., de Ridder, H., & Pont, S. (2018).
Journal of Vision, 18(11), 1-19. doi:10.1167/18.11.11
- MatMix 1.0: Using optical mixing to probe visual material perception.**
Zhang, F., de Ridder, H., Fleming, R. W., & Pont, S. (2016).
Journal of Vision, 16(6), 11, 1-18. doi:10.1167/16.6.11
- Conference Paper **The influence of lighting on visual perception of material qualities.**
Zhang, F., de Ridder, H., & Pont, S. (2015).
In Proc. SPIE/IS&T 9394, Human Vision and Electronic Imaging XX, (pp. 93940Q-93940Q). The international society for optics and photonics.
doi:10.1117/12.2085021
- Invited Talk **Visual perception of canonical material modes and its interactions with canonical lighting modes.**
Zhang, F., de Ridder, H., & Pont, S. (2016, December).
Friday Colloquium (FriKo) of the Max Planck Institute for Biological Cybernetics, in Tübingen, Germany.
- Conference Abstract **Material dependent appearance effects brought out by natural light environments.**
Zhang, F., de Ridder, H., Barla, P., & Pont, S. (2017).
Poster session presented at European Conference on Visual Perception (ECVP), Berlin, Germany
- The interplay between material qualities and lighting.**
Zhang, F., de Ridder, H., van Egmond, R., & Pont, S. (2017, Talk).
Journal of vision, 17(10), 228-228. doi:10.1167/17.10.228
- Canonical Material and Illumination Confounds.**
Zhang, F., de Ridder, H., & Pont, S. (2016, Poster).
In *PERCEPTION* (Vol. 45, pp. 130-130).

Can people match optically mixed canonical lighting modes?

Zhang, F., de Ridder, H., & Pont, S. (2016, Poster).

Journal of Vision, 16(12), 642-642. doi:10.1167/16.12.642

The influence of illumination on perception of works by Jan Schoonhoven

Wijntjes, M., te Pas, S., Schoemaker, M. P., Pont, S., Zhang, F., Kartashova, T., & van Middelkoop, C., (2016).

Poster session presented at Visual Science of Art Conference (VSAC), Barcelona, Spain

Matmix 1.0, a noval material probe for quantitatively measuring visual perception of materials.

Zhang, F., de Ridder, H., & Pont, S. (2015, Poster).

Journal of Vision, 15(12), 824-824. doi:10.1167/15.12.824

Towards an interactive probe for material studies.

Zhang, F., de Ridder, H., & Pont, S. (2014, Poster).

In Proceedings Experiencing light 2014: international conference on the effects of light on wellbeing, Eindhoven, The Netherlands, 10-11 November 2014 (p. 119).