

PERSONAL INFORMATION

Family name, First name: Toscani, Matteo

Date of birth: 24.01.1985

Nationality: Italian

Family status: married, one daughter

URL for web site: <http://www.allpsych.uni-giessen.de/toscani>



I did my undergraduate work in Florence (Italy), followed by an MSc thesis on the electroencephalographic correlates of visual sensitivity. After my graduation I moved to Giessen (Germany) to work in one of Europe's top vision laboratories, with Karl Gegenfurtner. There I developed interest in visual appearance of complex realistic stimuli; and specifically how their lightness is affected by the way we move our eyes. After finishing my thesis, a position as an independent PostDoc allowed me to take advantage of the great research environment in Giessen. I extended my horizon by working on color with Karl Gegenfurtner, and lately on the perception of material properties with Roland Fleming and Katja Dörschner. I am currently pursuing collaborations with the haptics group of Knut Drewing in Giessen. Outside Giessen, I worked with Pascal Mamassian investigating metacognition in peripheral vision, and appearance of complex materials with Claudio and Dar'ya Guarnera.

From 2021 I am a Lecturer at Bournemouth University.

EDUCATION

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| 2013 | PhD in Natural Sciences
Department of Psychology, Justus-Liebig-Universität Gießen, Germany
Name of PhD Supervisor: Karl Reinhard Gegenfurtner |
| 2009 | M.Sc in Experimental Psychology (Laurea Specialistica).
Department of Psychology, University of Florence, Italy |
| 2007 | B.Sc in General and Experimental Psychology (Laurea Triennale).
Department of Psychology, University of Florence, Italy |

CURRENT POSITION

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| 2021 – | Lecturer
Department of Psychology, Bournemouth University, UK |
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PREVIOUS POSITIONS

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| 2013 – | Post-doctoral fellow
Department of Psychology, Justus-Liebig-Universität Gießen, Germany |
| 2010 – 2013 | PhD student
Department of Psychology, Justus-Liebig-Universität Gießen, Germany |

FELLOWSHIPS AND AWARDS

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| 2018 | Best paper award – Eurohaptics Conference, Pisa, Italy |
| 2014 | Best PhD Dissertation award, Giessen, Germany |
| 2012 | Student award. European Conference on Visual Perception, Alghero, Italy |

2010 Travel Grant. From points and lines, to surfaces and volumes, Rovereto, Italy
2010 Fellowship for the European Summer School Visual Neurosciences, Rauischholzhausen, Germany

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2015- Supervision and Co-supervision of 4 Master, 6 Bachelor and 2 project students.
Department of Psychology, Justus-Liebig-Universität Gießen, Germany
2015- Co-supervision of 2 PhD students.

TEACHING ACTIVITIES

2012 - European Summer School of Visual Neuroscience – from spikes to awareness.
Tutorial on color perception for 30 PhD students and PostDocs from all over the world.
2021 - Seminar in biological psychology (30 students, 51 contact hours). First year psychology students (University of Giessen)

REVIEWING ACTIVITIES

Invited peer reviewer for interdisciplinary journals (Behavior Research Methods, Journal of Experimental Psychology, PLoS ONE, Psychological Research, Frontiers in Psychology, Psihologija) and specialist journals for the fields of visual perception and haptics (Journal of Vision, Vision Research, IEEE Transactions on Haptics, Vision, i-Perception, Color research and application, Optik – International Journal for Light and Electron Optics, Art& Perception). My reviewing work for the Journal of Vision (one of the top journals in Vision Science) received the *ranking of "Exceptionally Good Review"* twice.

Invited reviewer for the following conferences: ACM SIGGRAPH VRCAI 2019, IEE Eurohaptics 2020, ECVP 2021

I reviewed a grant proposal for the US National Science Foundation (NSF).

ORGANISATION OF SCIENTIFIC MEETINGS

2020 Member of the program committee of CVCS 2020 (Color and Visual Computing Symposium 2020), Gjøvik, Norway.

COLLABORATIONS

Katja Doerschner, material and color perception, Department of General Psychology, Justus-Liebig-University, Germany

Knut Drewing, haptic perception, Department of General Psychology, Justus-Liebig-University, Germany

Roland Fleming, material perception, Department of General Psychology, Justus-Liebig-University, Germany

Jon Yngve Hardeberg, material perception, Department of Computer Science, NTNU in Gjøvik

Pascal Mamassian, metacognition, Laboratoire des Systèmes Perceptifs, Ecole Normale Supérieure, France

Sunčica Zdravković, lightness perception, Laboratory for Experimental Psychology, Faculty of Philosophy, University of Belgrade, Serbia

Matteo Valsecchi, peripheral vision, material perception, and haptics. Dipartimento di Psicologia, Università di Bologna, Italy

Juno Kim, material perception School of Optometry and Vision Science, University of Sydney, Australia

Giuseppe Claudio Guarnera, material perception, computer graphics, University of York, United Kingdom.

Christoph Witzel, individual differences in color perception, University of Southampton.

Arash Akbarinia, deep neural network modelling, University of Giessen.

SCIENTIFIC PRODUCTION

Papers in international peer-reviewed scientific journals: 33 and 2 preprints.

Total citations: 577 (Google Scholar)

H-Index: 13

Prizes / Awards

- 2018 Best paper award – Eurohaptics, Pisa, Italy
- 2014 Best PhD Dissertation award, Giessen, Germany
- 2012 Student award. European Conference on Visual Perception, Alghero, Italy
- 2012 Travel Grant. From points and lines, to surfaces and volumes, Rovereto, Italy
- 2010 Fellowship for the European Summer School Visual Neurosciences, Rauischholzhausen, Germany

Publications in international peer-reviewed scientific journals (and two pre-prints)

(*Publications without PhD supervisor as co-author (Gegenfurtner, K.R.))

(+ shared first authorship)

1. Gil-Rodríguez, R., Bayer, F., **Toscani, M.**, Guarnera, D., Guarnera, G. C., Gegenfurtner, K. R. (2021). Colour Calibration of Head Mounted Display for Colour Research using Virtual Reality. *SN Computer Science*. Accepted
2. *Metzger+ A., & **Toscani+ M.** (2021). Unsupervised learning of haptic material properties. *bioRxiv*. Under review in *eLife* (<https://tinyurl.com/4zbbb7pt>.)
3. *Metzger, A., **Toscani, M.**, Valsecchi, M., Drewing, K., (2021). Target search and inspection strategies in haptic search. *Transactions on haptics*. In press.
4. ***Toscani, M.**, Mamassian, P., Valsecchi, M. (2021). Under-confidence in peripheral vision. *Journal of Vision*. In press.
5. *Metzger+ A., & **Toscani+ M.**, Valsecchi M., Akbarinina A., Drewing K. (2021). Deep neural network model of haptic saliency. *Scientific Reports*, 11(1), 1-14.
6. *Isherwood, Z. J., Huynh-Thu, Q., Arnison, M., Monaghan, D., **Toscani, M.**, Perry, P., Honson, V., Kim, J. (2021). Surface properties and the perception of colour. *Journal of Vision*, 21(2), 1-22.
7. *Akbarinia, A., Gil-Rodríguez, R., Flachot, A., & **Toscani, M.** (2020). The Utility of Decorrelating Colour Spaces in Vector Quantised Variational Autoencoders. *arXiv:2009.14487*.
8. **Toscani, M.**, Guarnera, D. Y., Guarnera, G. C., Hardeberg, J. Y., & Gegenfurtner, K. R. (2020). Three perceptual dimensions for specular and diffuse reflection. *ACM Transactions on Applied Perception (TAP)*, 17(2), 1-26.
9. **Toscani, M.**, Milojevic, Z., Fleming, R. W., & Gegenfurtner, K. R. (2020). Color consistency in the appearance of bleached fabrics. *Journal of Vision*, 20(4), 1-20.
10. *Witzel, C. & **Toscani, M.** How to make a #theDress. *JOSA A* 37, no. 4 (2020): A202-A211.
11. ***Toscani, M.**, Yücel, E. I., & Doerschner, K. (2019). Gloss and speed judgments yield different fine tuning of saccadic sampling in dynamic scenes. *i-Perception*, 10(6), 2041669519889070.
12. **Toscani, M.**, Gil, R., Guarnera, D. Y., Guarnera, G., Kalouaz, A., & Gegenfurtner, K. R. (2019, November). Assessment of OLED Head Mounted Display for Vision Research with Virtual Reality. In 2019 15th International Conference on Signal-Image Technology & Internet-Based Systems (SITIS) (pp. 738-745). IEEE.
13. ***Toscani, M.**, & Valsecchi, M. (2019). Lightness discrimination depends more on bright rather than shaded regions of three-dimensional objects. *i-Perception*, 10(6), 2041669519884335.
14. *Metzger, A., **Toscani, M.**, Valsecchi, M., & Drewing, K. (2019, July). Dynamics of exploration in haptic earch. In 2019 IEEE World Haptics Conference (WHC) (pp. 277-282). IEEE.
15. Guarnera, D. Y., Guarnera, G., **Toscani, M.**, Glencross, M., Li, B., Hardeberg, Y. J., and Gegenfurtner, K. R. Perceptually validated cross-renderer analytical BRDF parameter remapping. *IEEE transactions on visualization and computer graphics* (2018).
16. *Metzger, A., **Toscani, M.**, Valsecchi, M., & Drewing, K. (2018, June). Haptic Saliency Model for Rigid Textured Surfaces. In International Conference on Human Haptic Sensing and Touch Enabled Computer Applications (pp. 389-400). Springer, Cham.
17. Guarnera, D. Y., Guarnera, G. C., **Toscani, M.**, Glencross, M., Li, B., Hardeberg, J. Y., & Gegenfurtner, K. R. (2018, August). Perceptually validated analytical BRDFs parameters remapping. In ACM SIGGRAPH 2018 Talks (p. 17). ACM.
18. Ennis, R., Schiller, F., **Toscani, M.**, & Gegenfurtner, K. R. (2018). Hyperspectral database of fruits and vegetables. *JOSA A*, 35(4), B256-B266.

19. Milojevic, Z., Ennis, R., **Toscani, M.**, & Gegenfurtner, K. R. (2018). Categorizing natural color distributions. *Vision research*, 151 (2018): 18-30
20. **Toscani, M.**, Gegenfurtner, K. R., & Valsecchi, M. (2017). Foveal to peripheral extrapolation of brightness within objects. *Journal of vision*, 17(9), 1-14.
21. Ennis+, R., **Toscani+, M.**, & Gegenfurtner, K. R. (2017). Seeing lightness in the dark. *Current Biology*, 27(12), R586-R588. [IF 8.851]
22. **Toscani, M.**, Gegenfurtner, K. R., & Doerschner, K. (2017). Differences in illumination estimation in
23. #thedress. *Journal of Vision*, 17(1), 22-22.
24. **Toscani, M.**, Valsecchi, M., & Gegenfurtner, K. R. (2017). Lightness perception for matte and glossy complex shapes. *Vision research*, 131, 82-95.
25. **Toscani, M.**, Zdravković, S., & Gegenfurtner, K. R. (2016). Lightness perception for surfaces moving through different illumination levels. *Journal of vision*, 16(15), 1-18.
26. Gegenfurtner, K. R., Bloj, M., & **Toscani, M.** (2015). The many colours of ‘the dress’. *Current Biology*, 25(13), R543-R544.
27. Wiebel, C. B., **Toscani, M.**, & Gegenfurtner, K. R. (2015). Statistical correlates of perceived gloss in natural images. *Vision research*, 115, 175-187.
28. **Toscani, M.**, Valsecchi, M., & Gegenfurtner, K. R. (2015, March). Effect of fixation positions on perception of lightness. In *Human Vision and Electronic Imaging XX* (Vol. 9394, p. 93940R). International Society for Optics and Photonics.
29. **Toscani, M.**, Valsecchi, M., & Gegenfurtner, K. R. (2013). Optimal sampling of visual information for lightness judgments. *Proceedings of the National Academy of Sciences*, 110(27), 11163-11168.
30. **Toscani, M.**, Valsecchi, M., & Gegenfurtner, K. R. (2013). Selection of visual information for lightness judgements by eye movements. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 368(1628), 20130056.
31. Valsecchi, M., **Toscani, M.**, & Gegenfurtner, K. R. (2013). Perceived numerosity is reduced in peripheral vision. *Journal of Vision*, 13(13), 1-16.
32. *Righi, S., Marzi, T., **Toscani, M.**, Baldassi, S., Ottonello, S., & Viggiano, M. P. (2012). Fearful expressions enhance recognition memory: electrophysiological evidence. *Actapsychologica*, 139(1), 7-18.
33. Granzier, J. J., **Toscani, M.**, & Gegenfurtner, K. R. (2012). Role of eye movements in chromatic induction. *JOSA A*, 29(2), A353-A365.
34. **Toscani, M.**, Valsecchi, M., & Gegenfurtner, K. R. (2012). The Optimal Estimator of Objects’ Lightness. In *Predicting Perceptions: Proceedings of the 3rd International Conference on Appearance* (p. 167). Lulu.com.
35. ***Toscani, M.**, Marzi, T., Righi, S., Viggiano, M. P., & Baldassi, S. (2010). Alpha waves: a neural signature of visual suppression. *Experimental brain research*, 207(3-4), 213-219.

Invited talks

- December 2020. Vrije Universiteit Amsterdam (Netherlands). “The interplay between central and peripheral information sampling affects visual appearance.”
- November 2020. Shanghai University of Sport (China). “The interplay between central and peripheral information sampling affects visual appearance.”
- September 2020. OSA Incubator on Visual Perception in AR/VR. “what are the limitations of commercially available AR/VR/MR for doing color perception experiments?”
- March 2020. Delft University of Technology, Delft (Netherlands). “The interplay between central and peripheral information sampling affects visual appearance.”
- February 2020. Max Planck Institute for Empirical Aesthetics, Frankfurt (Germany). Eye-Tracking Day symposium. “The interplay between central and peripheral information sampling affects visual appearance.”
- November 2019, Goethe Universität Frankfurt (Germany). Seminar at the Scene Grammar Lab. “The interaction between visual appearance and eye-movements”

Contribution in conferences

- May 2021. Naples (Florida-virtual) Poster presentation. "Perceptual haptic representation of materials emerges from efficient encoding" (Metzger, A; Toscani, M) at the Vision Science Society Annual Meeting.
- May 2021. Naples (Florida-virtual) Poster presentation. "Variations of saturation in natural objects and their effects on perception" (Hedjar L., Toscani M., Gegenfurtner K.R.) at the Vision Science Society Annual Meeting.
- March 2021. Ulm (Germany-virtual). Oral presentation: "Deep neural network model of haptic saliency". (Metzger A., Toscani M., Akbarinia A., Valsecchi M., Drewing, K.) Conference of Experimental Psychologists (TEAP).
- March 2021. Ulm (Germany-virtual). Oral presentation: "Under-confidence in peripheral vision". (Toscani M., Mamassian P., Valsecchi M.) Conference of Experimental Psychologists (TEAP).
- May 2020. Naples (Florida): Poster presentation: "Foveation-like behavior in human haptic search". (Metzger, A; Toscani, M; Valsecchi, M; Drewing, K) at the Vision Science Society Annual Meeting.
- May 2020. Naples (Florida): Poster presentation: "Heterochromatic brightness and luminance". (Chadwick, A; Toscani, M; Chen, J; Gegenfurtner KR) at the Vision Science Society Annual Meeting.
- May 2020. Naples (Florida): Oral presentation: "Color constancy in a Virtual Reality environment". (Gil Rodriguez, R; Toscani, M; Guarnera, D; Guarnera, GC; Bayer, F; Gegenfurtner, KR) at the Vision Science Society Annual Meeting.
- November 2019. Sorrento (Italy): Oral presentation: "Assessment of OLED Head Mounted Display for vision research with Virtual Reality" (Toscani M, Gil R, Guarnera D, Guarnera GC, Kalouaz A, Gegenfurtner KR) at the IEEE Conference on Signal Image Technology and Internet based Systems (SITIS).
- August 2019. Leuven (Belgium): Oral presentation: "Heterochromatic Brightness" (Gegenfurtner KR, Chen J, Toscani M, Valsecchi M, Chadwick A, van Doorn A, Koenderink J) at the European Conference on Visual Perception.
- July 2019. Tokyo (Japan): Oral presentation: "Dynamics of exploration in haptic search" (Metzger A, Toscani M, Valsecchi M, Drewing K) at the World Haptics Conference (WHC).
- May 2019. Naples (Florida): Poster presentation: "Under-confidence in peripheral vision" (Toscani M, Gegenfurtner KR, Mamassian P, Valsecchi M) at the Vision Science Society Annual Meeting.
- May 2019. Naples (Florida): Poster presentation: "Initial fixations differ for brightness and stiffness judgements" (Alley LM, Toscani M, Ennis RJ, Doerschner K) at the Vision Science Society Annual Meeting.
- August 2018. Trieste (Italy): Oral presentation: "A Role for Metallicity in the Perception of Surface Reflectance" (Toscani M, Guarnera D, Guarnera GC, Hardeberg JY, Gegenfurtner KR) at the European Conference on Visual Perception.
- August 2018. Trieste (Italy): Poster presentation: "Different Fixation Patterns in Dynamic Scenes for Lightness and Stiffness Judgements" (Alley LM, Toscani M, Doerschner K) at the European Conference on Visual Perception.
- June 2018. Pisa (Italy): Oral presentation: "Haptic Saliency Model for Rigid Textured Surfaces". (Metzger A, Toscani M, Valsecchi M, Drewing K) at the EuroHaptics Annual Meeting.
- May 2018. Naples (Florida): Poster presentation: "Visual sensitivity to material differences". (Toscani M, Guarnera D, Guarnera GC, Hardeberg JY, Gegenfurtner KR) at the Vision Science Society Annual Meeting.
- August-September 2016. Barcelona (Spain): Oral presentation: "Object selective influence of fixated luminance on brightness perception in the periphery of the visual field" (Toscani M, Valsecchi M, Gegenfurtner KR) at the European Conference on Visual Perception.
- August-September 2016. Barcelona (Spain): Oral presentation: "Giessen's hyperspectral images of fruits and vegetables database (GHIFVD)" (Ennis RJ, Toscani M, Schiller F, Hansen T, Gegenfurtner KR) at the European Conference on Visual Perception.
- May 2016. Naples (Florida): Poster presentation: "Probing the illumination on #The Dress". (Toscani M, Gegenfurtner KR, Doerschner K) at the Vision Science Society Annual Meeting.
- August 2015. Liverpool (UK): Oral presentation: "Scotopic lightness perception" (Ennis RJ, Toscani M, Gegenfurtner KR) at the European Conference on Visual Perception.
- August 2014. Belgrade (Serbia): Oral presentation: "Perceived lightness over space and time" (Toscani M, Zdravković S, Gegenfurtner KR) at the European Conference on Visual Perception.
- May 2014. Naples (Florida): Poster presentation: "Predicting lightness rankings from image statistics of matte and glossy surfaces". (Toscani M, Valsecchi M, Gegenfurtner KR) at the Vision Science Society Annual Meeting.

August 2013. Bremen (Germany): Oral presentation: "Perceived numerosity in the peripheral visual field" (Valsecchi M, Toscani M, Gegenfurtner KR)

August 2013. Bremen (Germany): Oral presentation: "Predicting lightness judgments from luminance distributions of matte and glossy virtual objects " (Toscani M, Valsecchi M, Dilger MD, Zirbes A, Gegenfurtner KR) at the European Conference on Visual Perception.

May 2013. Naples (Florida): Poster presentation: "Lightness perception for glossy objects". (Toscani M, Valsecchi M, Gegenfurtner KR) at the Vision Science Society Annual Meeting.

September 2012. Alghero (Italy): Poster presentation: "Spatial frequency overestimation with retinal eccentricity for isoluminant chromatic gratings " (Toscani M, Valsecchi M, Gegenfurtner KR) at the European Conference on Visual Perception.

September 2012. Alghero (Italy): Poster presentation: "Perceived numerosity in the peripheral visual field" (Valsecchi M, Toscani M, Gegenfurtner KR) at the European Conference on Visual Perception.

May 2012. Naples (Florida): Poster presentation: "The optimal estimator of lightness" (Toscani M, Valsecchi M, Gegenfurtner KR) at the Vision Science Society Annual Meeting.

April 2012. Edinburgh (UK): Oral presentation: " The Optimal Estimator of Objects' Lightness" (Toscani M, Valsecchi M, Gegenfurtner KR) at the "Predicting Perception" 3rd Conference on Appearance.

September 2011. Toulouse (France): Oral presentation: "A functional link between image segmentation, lightness perception and eye movements? " (Toscani M, Gegenfurtner KR) at the European Conference on Visual Perception.

September 2011. Toulouse (France): Poster presentation: " Do individual differences in eye movements explain differences in chromatic induction between subjects? " (Granzier JM, Toscani M, Gegenfurtner KR).

July 2011. Florence (Italy): Poster presentation: "The role of eye movements in lightness perception" (Toscani M, Valsecchi M, Gegenfurtner KR) at the 8th IBRO World Congress of Neuroscience.

May 2011. Naples (Florida): Poster presentation: "Where we look determines what we see" (Toscani M, Valsecchi M, Gegenfurtner KR) at the Vision Science Society Annual Meeting.