Christian Tsvetkov

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http://chris7sv.github.org/

Education

2019 – Present **PhD candidate, University of Bristol, Bristol, United Kingdom** in Psychological Science
Thesis project: *Investigating the extent to which deep neural networks trained for visual tasks compare to human performance in generalising to novel tasks and stimuli. How to improve generalisation abilities of deep neural networks by modelling the human visual system.*

2015 – 2018 **M.Sc. Cognitive Science, New Bulgarian University, Sofia, Bulgaria** in Cognitive Science.
Thesis title: *"How do deep neural networks represent faces?"* .
Thesis project: *Project description: The project involved designing and running aligned behavioral experiments and neural network simulations in order to compare representational qualities in humans and deep convolutional neural networks.*

2010 – 2013 **B.A. in Art and Technology, Aalborg University, Aalborg, Denmark**

Research experience (employment)

2017 – 2018 **Research Assistant** New Bulgarian University, Sofia, Bulgaria
Project: 'Predicting future situations in analogy-making'
Responsibility: Developing computer simulations to test learning and generalization of relational categories in neural network models.

Teaching experience

2019 – 2021 **Assistant Teacher(TA)** University of Bristol, Bristol, United Kingdom
Assistant teacher for 2nd year undergraduate students in course "Research methods in psychology", focus on statistical analyses and experimental method for behavioural research. Used to working in large and small group settings. Responsibilities also included project supervision.

Research Publications

1. Bowers, J. S., Malhotra, G., Dujmović, M., Montero, M. L., **Tsvetkov**, **C.**, Biscione, V., … et al. (2022). Deep problems with neural network models of human vision. doi:10.31234/osf.io/5zf4s
2. **Tsvetkov**, **C.**, Malhotra, G., Evans, B. D., & Bowers, J. S. (2022). The role of capacity constraints in convolutional neural networks for learning random versus natural data. *bioRxiv*. doi:10.1101/2022.03.31.486580. eprint: https://www.biorxiv.org/content/early/2022/04/01/2022.03.31.486580.full.pdf. (Submitted to Neural Networks, Under review)
3. **Tsvetkov**, **C.**, Malhotra, G., Evans, B., & Bowers, J. (2020). Adding biological constraints to deep neural networks reduces their capacity to learn unstructured data. In *Proceedings of the 42nd annual conference of the cognitive science society 2020* (pp. 2358–2364).
4. **Tsvetkov**, **C.** (2018). *How do deep neural networks represent faces?*, New Bulgarian University. (Unpublished Master's thesis)

Skills

Programming languages	Excellent command of Python (2.7* and 3.*). Familiarity and good command of R. Some experience with MatLab/Octave, C#, Julia, Scala.
Deep learning and machine learning	Excellent knowledge of keras, Tensorflow, good familiarity with PyTorch, scikit-learn.
Scientific computing	Great command of numpy, scipy, scikit-image, pandas.
Plotting	Matplotlib, pyplot (Python). ggplot (R).
Other coding expertise	Experience with bash scripting and general unix command line knowledge. Familiarity with manuscript preparation with LaTeX(Overleaf). Basic version control with git.
Behavioural experiments	Expertise in designing experimental behavioural studies and collecting data using PsychoPy, E-Prime, OpenSesame. Good familiarity with online experiment hosting/data collection on Pavlovia. Good familiarity with online data collection on Prolific.
Communication	Some experience with academic publishing. A general interest in good writing and communication practices. Keen interest in visual communication and graphic design. Experience with teaching, both instruction and supervision. Experience working in big lab and coordinating projects with multiple collarborators.
Miscellaneous	Good command of image editing and graphical design software (Inkscape, Adobe InDesign, Adobe Photoshop).
Languages	Fluent in Bulgarian (native) and English (second language) Good reading and writing, and moderate speaking competencies in Spanish and Portuguese.

Talks and posters

Conference presentations

2020 **42nd Annual Virtual Meeting of the Cognitive Science Society (CogSci)** - "Adding biological constraints to deep neural networks reduces their capacity to learn unstructured data", poster presentation.

NAISys (From Neuroscience to Artificially Intelligent Systems) - "Diminishing learning of non-naturalistic data in deep neural networks using biological constraints" - abstract accepted for poster presentation. **Event cancelled due to Covid-19.**

2017 **BICA (Biologically Inspired Cognitive Architectures)** - "How do deep neural networks represent faces?", Poster presentation.

Department conferences and others

2020 **Postgraduate researcher conference, School of Psychological Sciences, University of Bristol** Online presentation: "Adding biological constraints to deep neural networks reduces their capacity to learn unstructured data"

2019 **Postgraduate researcher conference, School of Psychological Sciences, University of Bristol** Presentation: "Does structure prevent (over)memorization in convolutional neural networks?"

Talks and posters (continued)

2018
- **Summer school in cognitive science, New Bulgarian University**. Presentation: "How do deep neural networks represent faces?"
- **Winter school in cognitive science, New Bulgarian University**. Presentation: "Learning relational categories with neural networks"

Miscellaneous Experience

Awards and Achievements

2017
- **BICA Society Outstanding Research Award**

2016
- **CEEPUS Mobility grant**

Further qualifications and experience

2022
- Co-organising the Generalisation in Mind and Machine seminar series in University of Bristol.

2020
- **Neuromatch Academy** online summer school in computational neuroscience (observer track)

2016 – 2018
- **Cognitive Science Summer school**, New Bulgarian University, Sofia, Bulgaria

2016
- **Eötvös Loránd University (ELTE), Budapest, Hungary**, under CEEPUS mobility grant.

References

Available on Request