Connor J. Parde

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Research and Work Experience

Tong Lab, Psychology Department *Vanderbilt University, Nashville, TN*
POSTDOCTORAL RESEARCH FELLOW (SUPERVISOR: DR. FRANK TONG) *Oct. 2023 - Present*
- Investigate mechanisms underpinning high-level vision using computational models
- Collect and analyze human behavioral data in vision research

Exponent Inc. *New York City, New York*
SCIENTIFIC CONSULTANT (SUPERVISOR: DR. ROBERT RAUSCHENBERGER) *Nov. 2022 - Present*
- Develop and administer experimental protocol designed to measure perception in virtual-reality (VR) environments
- Serve as project manager for national-scale data-collection efforts
- Prepare literature reviews covering video-based misinformation in social media

Face Perception Research Lab, School of Behavioral and Brain Sciences *University of Texas at Dallas, Richardson, Texas*

RESEARCH ASSISTANT (SUPERVISOR: DR. ALICE O'TOOLE) *Aug. 2016 - Present*
- Collaborator on IARPA Janus program (multidisciplinary, government-funded face-identification challenge)
- Develop novel testing and analysis protocols for computer-based face-identification algorithms
- Present and publish research for real-world human and machine face perception
- Experimental design and analysis

Face Perception Research Lab, School of Behavioral and Brain Sciences *University of Texas at Dallas, Richardson, Texas*

UNDERGRADUATE RESEARCH ASSISTANT (SUPERVISOR: DR. ALICE O'TOOLE) *Oct. 2014 – July 2016*
- Design software to benchmark deep-learning models for face identification
- Develop solutions to analyze and interpret output from face-identification algorithms

SeRViCE Lab, Eric Jonsson School of Electrical Engineering and Computer Science *University of Texas at Dallas, Richardson, Texas*
UNDERGRADUATE RESEARCH ASSISTANT (SUPERVISOR: DR. NICHOLAS GANS) *Sept. 2013 – Oct. 2014*
- Automated image processing
- Touch-based applications programming

Education

PhD., Cognition and Neuroscience *Richardson, Texas, USA*
UNIVERSITY OF TEXAS AT DALLAS, SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES *Aug. 2016 – May, 2023*
- Supervisor: Dr. Alice O'Toole

M.S., Applied Cognition and Neuroscience *Richardson, Texas, USA*
UNIVERSITY OF TEXAS AT DALLAS, SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES *Aug. 2016 – May 2020*
- Supervisor: Dr. Alice O'Toole

B.S., Cognitive Science *Richardson, TX, USA*
UNIVERSITY OF TEXAS AT DALLAS, SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES *Aug. 2012 – May 2016*
- Supervisors: Dr. Nicholas Gans, Dr. Alice J. O'Toole

Skills

Programming/Software Python, R, Matlab, Java, C/C++, LaTeX
Analysis Machine learning, multivariate statistical analysis, signal detection theory, inferential statistics
Languages Native language proficiency in English, conversant in Spanish, basic knowledge in French

Awards

IEEE 15TH INTERNATIONAL SUMMER SCHOOL ON BIOMETRICS TRAVEL GRANT *2018*
- Total award amount: $1500

- Total award amount: $3000

- Total award amount: $6000

- Total award amount: $5000

Conference Presentations

Talks

- **Parde, C. J.**, Coloǹ, Y. I., Hill, M. Q., Castillo, C. D., O'Toole, A. J. "Integrating Single-Unit and Pattern Codes in DCNNs Trained for Face Recognition". 20th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2020) (virtual)
- Colón, Y. I., Hill, M. Q., **Parde, C. J.**, Castillo, C. D., Ranjan, R., O'Toole, A. J. "Facial expression information in deep convolutional neural networks trained for face identification". 20th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2020) (virtual)
- **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Castillo, C. D., O'Toole, A. J. "Integrating Single-Unit and Pattern Codes in DCNNs Trained for Face Recognition". British Psychological Society Cognitive Psychology Section Online Conference. (2020) (virtual)
- Hill, M. Q., **Parde, C. J.**, Chen, J. C., Castillo, C. D., Blanz, V., O'Toole, A. J. "Hierarchical representations of viewpoint and illumination in deep convolutional neural networks trained for face identification". 18th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2018).
- **Parde, C. J.**, Hu, Y., Castillo, C. D., Sankaranarayanan, S., O'Toole, A. J. "Predicting social trait inferences from deep convolutional neural networks trained for face identification". 15th International Summer School on Biometrics, Alghero, Italy. (2018)

Posters

- **Parde, C. J.**, Strehle, V. E., Banerjee, V., Hu, Y., Cavazos, J. G., Castillo, C. D., Cavazos, J., O'Toole, A. J. "Comparing Human and Deep Convolutional Neural Network Performance on Twin Identification". Poster presented at 22nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL (2022).
- Mallick, S., Jeckeln, G., **Parde, C. J.**, Castillo, C. D., O'Toole, A. J. "The Influence of the Other-Race Effect on Morphed Face Identification". Poster presented at 22nd Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL (2022).
- Colón, Y. I., **Parde, C. J.**, Hill, M. Q., Castillo, C. D., Cavazos, J., O'Toole, A. J. "Facial Expression Information in Humans and DCNNs". Poster presented at 20th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL (2020). (virtual)
- **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Castillo, C. D., O'Toole, A. J. "Concurrent representational codes in DCNNs trained for face identification". Poster presented at From Neuroscience to Artificially Intelligent Systems (NAISys), Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (2020). (virtual)
- Colón, Y. I., **Parde, C. J.**, Hill, M. Q., Castillo, C. D., Cavazos, J., O'Toole, A. J. "Facial Expression Information in Humans and DCNNs". Poster presented at 20th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL (2020). (virtual)
- **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Ranjan, R., Castillo, C. D., O'Toole, A.J. "Density of top-layer codes in deep convolutional neural networks trained for face identification". Poster presented at 19th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL (2019).
- **Parde, C. J.**, Hu, Y., Castillo, C. D., Sankaranarayanan, S., O'Toole, A. J. "Predicting social trait inferences from deep convolutional neural networks trained for face identification". Poster presented at Dartmouth Center for Cognitive Neuroscience Workshop, Hanover, NH (2018).
- Hu, Y., **Parde, C. J.**, Hill, M. Q., Mahmood, N., O'Toole, A. J. "Personality trait inferences from three-dimensional body shapes". Poster presented at the 18th Annual Meeting of the Vision Sciences Society, St. Pete Beach, Fl (2018).
- Noyes, E., Colón, Y. I., Hill, M. Q., **Parde, C. J.**, Castillo, C. D., Sankaranarayanan, S., O'Toole, A. J. "Face familiarity in deep convolutional neural networks". Poster presented at 18th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2018).
- **Parde, C. J.**, Hu, Y., Castillo, C. D., Sankaranarayanan, S., O'Toole, A. J. "Social networks: analyzing information in deep convolutional neural networks trained for face identification. Poster presented at 18th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2018).
- **Parde, C. J.**, Castillo, C. D., Hill, M. Q., Colón, Y. I., Sankaranarayanan, S., Chen, J. C., O'Toole, A. J. "Face representations in deep convolutional neural networks". Poster presented at the IEEE Conference on Automatic Face and Gesture Recognition, Washington, D.C. (2017).
- Noyes, E., **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Castillo, C. D., Chen, J. C., Jenkins, R., O'Toole, A. J. "Comparing human and deep convolutional neural network face-matching performance on disguised face images". Poster presented at 17th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2017).
- **Parde, C. J.**, Castillo, C. D., Hill, M. Q., Colón, Y. I., Sankaranarayanan, S., Chen, J. C., O'Toole, A. J. "Face representations in deep convolutional neural networks". Poster presented at 17th Annual Meeting of the Vision Sciences Society, St. Pete Beach, FL. (2017).

Professional/Invited Presentations

- **Parde, C. J.**. "Deep learning insights for single-unit and neural population codes in face recognition". Invited by the Different Minds Collaborative, University of Victoria, Victoria, BC (2021) (virtual)
- **Parde, C. J.**. "Integrating single-unit and pattern codes in a DCNN trained for face identification". Invited by the Postdoctoral and Early-Career Association of Researchers at The National Institute of Standards and Technology (NIST), Washington D.C. (2020) (virtual)
- Colón, Y. I, Hill, M. Q, **Parde, C. J.**, O'Toole, A. J. "Turning the black box white: how face recognition works in a deep convolutional neural network". Invited by the Different Minds Collaborative, University of Victoria, Victoria, BC (2020) (virtual)

Publications

- **Parde, C. J.**, Strehle, V. E., Banerjee, V., Hu, Y., Cavazos, J. G., Castillo, C. D., Cavazos, J., O'Toole, A. J. (2022). Twin identification over viewpoint change: A deep convolutional neural network surpasses humans. arXiv:2207.05316. *submitted for peer review*
- Mallick, S., Jeckeln, G., **Parde, C. J.**, Castillo, C. D., O'Toole, A. J. (2022). The Influence of the Other-Race Effect on Susceptibility to Face Morphing Attacks. arXiv:2204.12591. *submitted for peer review*
- **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Castillo, C. D., Dhar, P., & O'Toole, A. J. (2021). Closing the gap between single-unit and neural population codes: Insights from deep learning in face recognition. Journal of vision, 21(8), 15-15.
- Noyes, E., **Parde, C. J.**, Colón, Y. I., Hill, M. Q., Castillo, C. D., Jenkins, R., & O'Toole, A. J. (2021). Seeing through disguise: Getting to know you with a deep convolutional neural network. Cognition, 211, 104611.
- Hill, M. Q., **Parde, C. J.**, Castillo, C. D., Colon, Y. I., Ranjan, R., Chen, J. C., ... & O'Toole, A. J. (2019). Deep convolutional neural networks in the face of caricature. Nature Machine Intelligence, 1(11), 522-529.
- **Parde, C. J.**, Hu, Y., Castillo, C., Sankaranarayanan, S., & O'Toole, A. J. (2019). Social trait information in deep convolutional neural networks trained for face identification. Cognitive science, 43(6), e12729.
- Hu, Y., **Parde, C. J.**, Hill, M. Q., Mahmood, N., & O'Toole, A. J. (2018). First impressions of personality traits from body shapes. Psychological Science, 29(12), 1969-1983.
- O'Toole, A. J., Castillo, C. D., **Parde, C. J.**, Hill, M. Q., & Chellappa, R. (2018). Face space representations in deep convolutional neural networks. Trends in cognitive sciences, 22(9), 794-809.
- **Parde, C. J.**, Castillo, C., Hill, M. Q., Colón, Y. I., Sankaranarayanan, S., Chen, J. C., & O'Toole, A. J. (2017). Face and image representation in deep cnn features. In 2017 12th IEEE International Conference on Automatic Face & Gesture Recognition (FG 2017) (pp. 673-680). IEEE.

Professional Organizations and Memberships

Student Member, Vision Sciences Society (VSS)

Student Member, Institute of Electrical and Electronics Engineers (IEEE)

Teaching Experience

Undergraduate Research Mentor *Richardson, TX, USA*
SCHOOL OF BEHAVIORAL AND BRAIN SCIENCES *2016 – present*
- Work with undergraduate student researchers to develop clear, testable hypotheses for research in the fields of machine learning and face perception
- Provide instruction in computer programming to students seeking gain experience in technical fields
- Introduce students to concepts in data structures and data analysis

Guest Lecturer – Graduate Level *Richardson, TX, USA*
COGNITIVE SCIENCE FOR GRADUATE STUDENTS *2018, 2019*
- Lead lectures on the application of neural networks and machine learning in the brain sciences
- Introduce graduate students at the University of Texas at Dallas to modern algorithms including convolutional neural networks, generative adversarial networks, and recurrent neural networks
- Show how modern machine learning approaches can used to study computer vision

Guest Lecturer – Undergraduate Level *Richardson, TX, USA*
COGNITIVE SCIENCE FOR UNDERGRADUATE STUDENTS *2019*
- Teach undergraduate students at the University of Texas at Dallas the basics of neural networks
- Introduce students to computational concepts such as convolution, backpropagation, loss functions
- Demonstrate to students how machine-learning techniques can be applied to solve problems in computer vision

Robotic Art - STEAM Camp *Richardson, TX, USA*

Program Instructor *2014*

- Work with faculty in the Eric Jonsson School of Electrical Engineering and Computer science to develop an introductory computer programming summer camp for primary- and secondary-school students
- Introduce students to the basic principles of computer programming, including loops, if/else statements, binary logic, and more
- Assist students in developing creative ways to use computer programming as a component of a robotic art project to be constructed in the duration of the camp