

# Todd Goodall Bell

Computer Vision Prototyping Engineer

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Computer Vision Prototyping Engineer at Apple. Former postdoc research scientist at FRL. Earned PhD developing blind video source inspection framework for Netflix. Co-founded CargoSpectre, which specializes in automated freight dimensioning.

## Experience

**2020-04 - Present** **Apple**  
Computer Vision Prototyping Engineer

**2018-07 - 2020-04** **Facebook Reality Labs**  
Postdoctoral Research Scientist

- Conducted experiments involving human participants.
- Developed bottom-up “Virtual Eye” psychophysics model.
- Built DeepFovea ML model with Graphics Research team.

**2014-05 - 2020-04** **Cargo Spectre, LLC.**  
Co-founder and Vision Systems Specialist

- Developing vision algorithms for automatically dimensioning freight.
- Actively improving accuracy of both old and new algorithms with large data.
- Exploring deep data analytics for future offerings.

**2013-09 - 2018-05** **University of Texas at Austin**  
Graduate Research Assistant

- Applied “Natural Scene Statistics” to multiple imaging modalities.
- Developed video quality assessment algorithms.
- Constructed didactic videos for “Digital Video” graduate level class.
- Built automated source inspection framework for detecting video distortions.

**2016-05 - 2016-08** **Netflix**  
Graduate Intern/Contractor

- Applied video quality algorithms to cinematic content.
- Improved performance of VMAF.

**2015-05 - 2015-08**

## Education

**2012-08 - 2018-05** **PhD in Electrical and Computer Engineering, University of Texas at Austin**

- GPA 3.84/4.0
- Advisor Alan C. Bovik

**2012-08 - 2014-12** **MS in Electrical and Computer Engineering, University of Texas at Austin**

- GPA 4.0/4.0

**2007-08 - 2012-05** **BS in Computer Engineering, Clemson University**

- GPA 3.8/4.0

## Open Source Projects

- 2014-12 - 2020-04** - **scikit-video** @ <https://github.com/scikit-video>
  - Python module used for scientific digital video processing.
  - Actively lead organization and maintain code base.
- 2016-05 - 2017-05** - **VMAF** @ <https://github.com/Netflix/vmaf>
  - Python module used for video quality assessment
  - Contributed VIDMAP source inspection code.

## Technical Skills

### Languages

- Python (advanced)
- C++ (intermediate)
- CUDA (intermediate)

### Operating Systems

- Linux (advanced)
- MacOS (intermediate)
- Windows 10 (intermediate)

### Deep Learning Frameworks

- Tensorflow (advanced)
- MxNet (intermediate)
- PyTorch (intermediate)

## Patents

J. [Jason] Joachim, J. [Jeremy] Joachim, M. Glombicki, S. Bernstein, and T. Goodall. System and Method for Digitally Scanning an Object in Three Dimensions. Awarded 2018.

A. Aaron, Z. Li, and T. Goodall. Techniques for robustly predicting perceptual video quality. Submitted 2016.

T. Goodall and A. Bovik. Distinguishing Between Infrared Images and Videos and Visible Light Images and Videos Using Only Image Pixel-Level Data. Submitted 2015.

T. Goodall and A. Bovik. Measurement of Additive Non-Uniformity Noise Produced in Infrared Images or Videos. Submitted 2015.

## Publications

M. Chen, Y. Jin, T. Goodall, X. Yu, A. C. Bovik. Study of 3D Virtual Reality Picture Quality. JSTSP. 2019.

A. Kaplanyan, A. Sochenov, T. Leimkühler, M. Okunev, T. Goodall, and G. Rufo. DeepFovea: Neural Reconstruction for Foveated Rendering and Video Compression using Learned Statistics of Natural Videos. SIGGRAPH Asia. 2019.

T. Goodall. Virtual Eye: a Spatial-Temporal Bottom-Up Eye Sensitivity Model. Computational and Mathematical Models in Vision. 2019.

T. Goodall and A. C. Bovik. Detecting and Mapping Video Impairments. Transactions on Image Processing. 2019.

T. Goodall and A. C. Bovik. Artifact Detection Maps Learned using Shallow Convolutional Networks. Southwest Symposium on Image Analysis and Interpretation. 2018.

T. Goodall and A. C. Bovik. Detecting Source Artifacts with Supervised Sparse Filters. Picture Coding Symposium. 2018.

T. Goodall, M. Esteva, S. Sweat, and A. C. Bovik. Towards Automated Quality Curation of Video Collections from a Realistic Perspective. IEEE Conference on Big Data. 2017.



## Publications (continued)

A. C. Bovik, C. Bampis, and T. Goodall. Perceptual Issues of Streaming Video. Society for Information Display. 2017.

C. Bampis, T. Goodall, and A. C. Bovik. Sampled Efficient Full-Reference Image Quality Assessment Models. Asilomar Conference on Signals, Systems, and Computers. 2016.

T. Goodall, I. Katsavounidis, Z. Li, A. Aaron, and A. C. Bovik. Blind Picture Upscaling Ratio Prediction. IEEE Signal Processing Letters. 2016.

T. Goodall, A. C. Bovik, N. G. Paulter, and H. Vikalo, Non-uniformity Correction of IR Images using Natural Scene Statistics. IEEE Global Conference on Signal and Information Processing. 2015.

T. Goodall, A. C. Bovik, and N. G. Paulter Jr., "Tasking on Natural Statistics of Infrared Images." IEEE Transactions on Image Processing. 2015.

M. Esteva, A. Bowen, T. Goodall, A. C. Bovik, and Z. B. Abel. "Evaluation of Non-Reference Quality Assessment Algorithms to Curate Born-Digital Video Collections." IS&T Archiving Conference. 2015.

J. Jendzurski, N. G. Paulter, F. Amon, E. Jacobs, A. C. Bovik, and T. Goodall. "Image Quality Testing: Selection of Images for Assessing Test Subject Input." Proceedings of the 8th International Conference on Sensing Technology. 2014.

T. Goodall and A. C. Bovik. "No-Reference Task Performance Prediction on Distorted LWIR Images." 2014 Southwest Symposium on Image Analysis and Interpretation. 2014.

T. Goodall, S. Gibson, and M. C. Smith. "Parallelizing Principal Component Analysis for Robust Facial Recognition Using CUDA." Symposium on Application Accelerators in High-Performance Computing. 2012.