Michael F. Bonner

mfbonner@jhu.edu
153 Krieger Hall
3400 N. Charles Street
Baltimore, MD 21218
bonnerlab.org

ACADEMIC APPOINTMENTS

Assistant Professor
Department of Cognitive Science, Johns Hopkins University 2019-present

Postdoctoral Fellow
Department of Psychology, University of Pennsylvania 2014-2018
Department of Neurology, University of Pennsylvania 2013-2014

EDUCATION

PhD University of Pennsylvania 2012
Neuroscience
Advisor: Professor Murray Grossman
Thesis: Neural representations at the interface of perception and memory

BS Pennsylvania State University 2005
Biochemistry and Molecular Biology
Minors in Chemistry and Microbiology

WORKING PAPERS

1. McMahon E, Im EJ, **Bonner MF**, & Isik L (submitted) A spatiotemporal hierarchy for social interaction perception in the lateral visual stream

2. Gauthaman RM, Ménard B, & **Bonner MF**. (submitted) Universal scale-free representations in human visual cortex, arXiv, doi: 2409.06843

3. Kazemian A, Elmozino E, & **Bonner MF**. (submitted) Convolutional architectures are cortex-aligned de novo, bioRxiv, doi: 10.1101/2024.05.10.593623

4. Li SPD & **Bonner MF** (submitted) Emergent selectivity for scenes, object properties, and contour statistics in feedforward models of scene-preferring cortex. bioRxiv, doi: 10.1101/2021.09.24.461733

PUBLICATIONS

1. Rong Y, Conwell C, & **Bonner MF**. (2025) Neural networks and brains share the gist but not the details. *CCN Proceedings*

2. Chen Z & **Bonner MF**. (2025) Universal dimensions of visual representation. *Science Advances*

3. Garcia K, McMahon E, Conwell C, **Bonner MF**, & Isik L. (2025). Modeling dynamic social vision highlights gaps between deep learning and humans. ICLR

4. Hafri AA, **Bonner MF**, Landau B, & Firestone C (2024) A Phone in a Basket Looks Like a Knife in a Cup: Role-Filler Independence in Visual Processing. *Open Mind*

5. Qu C, **Bonner MF**, DeWind NK, & Brannon EM (2024) Contextual coherence increases perceived numerosity independent of semantic content. *Journal of Experimental Psychology: General*

6. Elmoznino E & **Bonner MF** (2024) High-performing neural network models of visual cortex benefit from high latent dimensionality. *PLOS Computational Biology*

7. Robinson BS, Drenkow N, Conwell C, & **Bonner MF** (2023) A sparse null code emerges in deep neural networks. *NeurIPS UniReps Workshop*

8. McMahon E, **Bonner MF**, & Isik L (2023) Hierarchical organization of social action features along the lateral visual pathway. *Current Biology*

9. Magri C, Elmoznino E, & **Bonner MF** (2023) Scene context is predictive of unconstrained object similarity judgments. *Cognition*

10. Hafri, A, Wadhwa, S, & **Bonner, MF** (2022). Perceived distance alters memory for scene boundaries. *Psychological Science*

11. Lin F, Hafri AA, & **Bonner MF** (2022) Scene memories are biased toward high-probability views. *Journal of Experimental Psychology: Human Perception and Performance*

12. Harel A, Nador J, **Bonner MF**, Epstein RA (2022) Early electrophysiological markers of navigational affordances in scenes. *Journal of Cognitive Neuroscience*

13. Dwivedi K, **Bonner MF**, Cichy RM, & Roig G. (2021) Unveiling functions of the visual cortex using task-specific deep neural networks. *PLOS Computational Biology*

14. **Bonner MF** & Epstein RA (2021) Object representations in the human brain reflect the co-occurrence statistics of vision and language. *Nature Communications*

15. Elmoznino E & **Bonner MF** (2020) Visual representations derived from multiplicative interactions. *NeurIPS SVRHM Workshop*

16. Li SPD & **Bonner MF** (2020) Curvature as an Organizing Principle of Mid-level Visual Representation: A Semantic-preference Mapping Approach. *NeurIPS SVRHM Workshop*

17. DeWind NK, **Bonner MF**, & Brannon EM (2020) Similarly oriented objects appear more numerous. *Journal of Vision*

18. **Bonner MF** & Epstein RA (2018) Computational mechanisms underlying cortical responses to the affordance properties of visual scenes. *PLOS Computational Biology*

19. **Bonner MF** & Epstein RA (2017) Coding of navigational affordances in the human visual system. *Proceedings of the National Academy of Sciences*

20. Price AR, **Bonner MF**, Peelle JE & Grossman M (2017) Neural coding of fine-grained object knowledge in perirhinal cortex. *bioRxiv*, doi: 10.1101/194829

21. Price AR, Peelle JE, **Bonner MF**, Grossman M & Hamilton RH (2016) Causal evidence for a mechanism of semantic integration in the angular gyrus as revealed by high-definition transcranial direct current stimulation. *Journal of Neuroscience*

22. **Bonner MF**, Price AR, Peelle JE & Grossman M (2016) Semantics of the visual environment encoded in parahippocampal cortex. *Journal of Cognitive Neuroscience*

23. Price AR, **Bonner MF** & Grossman M (2015) Semantic memory: cognitive and neuroanatomical perspectives. In: *Brain Mapping: An Encyclopedic Reference.* Academic Press: Elsevier, Amsterdam

24. Price AR, **Bonner MF**, Peelle JE & Grossman M (2015) Converging evidence for the neuroanatomic basis of combinatorial semantics in the angular gyrus. *Journal of Neuroscience*

25. **Bonner MF** & Grossman M (2014) The neural basis of semantic memory. In: *Dementia and Memory*. Psychology Press

26. **Bonner MF** & Grossman M (2013) Deficits in semantic memory associated with focal neurodegenerative diseases. In: *The Boston Process Approach to Neuropsychological Assessment: A Practitioner's Guide*. Oxford University Press

27. **Bonner MF** & Price AR (2013) Where is the anterior temporal lobe and what does it do? *Journal of Neuroscience*

28. **Bonner MF**, Peelle JE, Cook PA & Grossman M (2013) Heteromodal conceptual processing in the angular gyrus. *NeuroImage*

29. Grossman M, Peelle JE, Smith EE, McMillan CT, Cook P, Powers J, Dreyfuss M, **Bonner MF**, Richmond L, Boller A, Camp E & Burkholder L (2013) Category-specific semantic memory: Converging evidence from BOLD fMRI and Alzheimer's disease. *NeuroImage*

30. **Bonner MF** & Grossman M (2012) Gray matter density of auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Journal of Neuroscience*

31. Grossman M, **Bonner MF** & Weinstein J (2011) Music and Semantic Dementia—Reply. *Archives of Neurology*

32. Weinstein J, Koenig P, Gunawardena D, McMillan C, **Bonner MF** & Grossman M (2011) Preserved musical semantic memory in semantic dementia. *Archives of Neurology*

33. **Bonner MF**, Ash S & Grossman M (2010) The new classification of primary progressive aphasia into semantic, logopenic, or nonfluent/agrammatic variants. *Current Neurology and Neuroscience Reports*

34. Farag C, Troiani V, **Bonner MF**, Powers C, Avants B, Gee J, & Grossman M (2010) Hierarchical organization of scripts: converging evidence from fMRI and frontotemporal degeneration. *Cerebral Cortex*

35. **Bonner MF**, Vesely L, Price C, Anderson C, Richmond L, Farag C, Avants B & Grossman M (2009) Reversal of the concreteness effect in semantic dementia. *Cognitive Neuropsychology*

36. Zhang R, Liu ST, Chen W, **Bonner MF**, Pehrson J, Yen TJ & Adams PD (2007) HP1 proteins are essential for a dynamic nuclear response that rescues the function of perturbed heterochromatin in primary human cells. *Molecular and Cellular Biology*

CONFERENCE TALKS

1. Conwell C & **Bonner MF**. (2025) Model manifold analysis suggests human ventral vision is less like an optimal classifier and more like a feature bank. *Vision Sciences Society*, St. Pete Beach, FL, To be presented May 2025

2. Garcia K, McMahon E, Conwell C, **Bonner MF**, & Isik L. (2024) Dynamic, social vision highlights gaps between deep learning and human behavior and neural responses. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

3. Gauthaman RM, Ménard B, & **Bonner MF**. The high-dimensional structure of natural image representations varies systematically across visual cortex. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

4. Garcia K, Conwell C, McMahon E, **Bonner MF**, & Isik L. Large-scale deep neural network benchmarking in dynamic social vision. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

5. Robinson BS, Drenkow N, Conwell C, & **Bonner MF** (2023) A sparse null code emerges in deep neural networks. *NeurIPS UniReps Workshop*, New Orleans, LA, December 2023

6. Gauthaman RM, Kazemian A, Chen Z, Guth F & **Bonner MF**. Tutorial: A high-dimensional perspective on computational neuroscience. *Conference on Cognitive Computational Neuroscience*, Oxford, UK, August 2023

7. Kazemian A, Elmoznino E & **Bonner MF**. Toward a computational neuroscience of visual cortex without deep learning. *Vision Sciences Society*, St. Pete Beach, FL, May 2023

8. Chen Z & **Bonner MF**. Canonical dimensions of neural visual representation. *Vision Sciences Society*, St. Pete Beach, FL, May 2023

9. McMahon E, **Bonner MF**, & Isik L. The spatiotemporal dynamics of social scene perception in the human brain. *Vision Sciences Society*, St. Pete Beach, FL, May 2023

10. Elmoznino E & **Bonner MF**. Latent dimensionality scales with the performance of deep learning models of visual cortex. *Vision Sciences Society*, St. Pete Beach, FL, May 2022

11. Elmoznino E & **Bonner MF**. Latent dimensionality scales with the performance of deep learning models of biological vision. *NeuroMatch*, Virtual Event, December 2021

12. Li SPD & **Bonner MF**. Deep neural network models of visual cortex reveal curvature and real-world size as organizing principles of mid-level representation. *Vision Sciences Society*, Virtual Event, May 2021

    - Selected for a travel award

13. Magri C & **Bonner MF**. The unreasonable effectiveness of context: Object representations are well predicted by computational models of their natural scene contexts. *Vision Sciences Society*, Virtual Event, May 2021

    - Selected for a travel award

14. Wadhwa S, Hafri A & **Bonner MF**. "Honey, I shrunk the scene": Changing perceived distance alters memory for scene boundaries. *Vision Sciences Society*, Virtual Event, May 2021

15. **Bonner MF** & Epstein RA. Computational mechanisms underlying the cortical analysis of affordance properties in visual scenes. *Society for Neuroscience*, Washington D.C., November 2017

16. **Bonner MF** & Epstein RA. Neural coding of navigational affordances in visual scenes. *Society for Neuroscience*, San Diego, CA, November 2016

17. **Bonner MF**, Ryan J & Epstein RA. Neural coding of navigational affordances in visual scenes. *Vision Sciences Society*, St. Pete Beach, FL, May 2016

18. Price AR, **Bonner MF**, Peelle JE & Grossman M. Neural mechanisms for object semantics: fine-grained feature statistics for object representation. *Society for Neuroscience*, Chicago, IL, October 2015

19. Price AR, **Bonner MF**, Peelle JE & Grossman M. Neural coding of object knowledge reflects the co-occurrence statistics of the environment. *Vision Sciences Society*, St. Pete Beach, FL, May 2015

20. Price AR, Hamilton RH, **Bonner MF**, Peelle JE & Grossman M. Modulating language comprehension using HD-tDCS. *NYC Neuromodulation*, New York, NY, January 2015

21. Price AR, **Bonner MF**, Peelle JE & Grossman M. Modulating conceptual combination using focal non-invasive brain stimulation. *Society for Neuroscience*, Washington D.C., November 2014

22. **Bonner MF**, Peelle JE, Price AR & Grossman M. Structural covariance of the semantic memory network in healthy adults. *Society for the Neurobiology of Language,* San Diego, CA, November 2013

23. **Bonner MF**, Price AR, Peelle JE & Grossman M. At the interface of visual perception and long-term memory: Object knowledge and the medial temporal lobe. *Workshop on Concepts, Actions, and Objects,* Rovereto, Italy, May 2013

    - Selected for an abstract award

24. **Bonner MF**, Price AR, Peelle JE & Grossman M. At the interface of visual perception and long-term memory: Object knowledge and the medial temporal lobe. *Vision Sciences Society*, Naples, FL, May 2013

25. **Bonner MF**, Price AR, Peelle JE & Grossman M. The medial temporal lobe supports visual semantic memory. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

26. Price AR, **Bonner MF**, Peelle JE & Grossman M. Conceptual combination in the angular gyrus. *Society for Neuroscience*, New Orleans, LA, October 2012

27. **Bonner MF**, Price AR, Peelle JE & Grossman M. The medial temporal lobe supports visual conceptual memory. *Society for Neuroscience*, New Orleans, LA, October 2012

28. **Bonner MF**, Vesely L, McMillan C, Avants B & Grossman, M. Reversal of the concreteness effect for verbs in semantic dementia. *Society for Neuroscience,* Chicago, IL, October 2009

29. **Bonner MF***.* Free association in semantic dementia: The importance of being abstract. *Winter School for the International Research Training Group,* Aachen, Germany, October 2008

CONFERENCE POSTERS

1. Gauthaman RM, Ménard B, & **Bonner MF**. (2024) Universality in mouse and human visual cortex: relating covariance to the spatial structure of latent dimensions. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

2. Shen T, Gauthaman RM, Conwell, C, & **Bonner MF**. (2024) High-dimensional alignment of neural networks and visual cortex. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

3. Robinson B, Conwell, C, & **Bonner MF**. (2024) Representational subspaces with different levels of abstraction in transformers. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

4. Passi A & **Bonner MF**. (2024) A local unsupervised learning algorithm for building a visual hierarchy. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

5. Han C & **Bonner MF**. (2024) High-dimensional spectrum of reliable individual differences in visual cortex. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

6. Chen Z & **Bonner MF**. (2024) Accounting for the reliability of deep neural networks in representational modeling. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

7. McMahon E, Im EJ, **Bonner MF**, & Isik L. (2024) An EEG-fMRI Investigation of the Spatiotemporal Hierarchy of Social Actions. *Conference on Cognitive Computational Neuroscience*, Cambridge, MA, August 2024

8. Rong Y, Conwell C, & **Bonner MF**. Unveiling core, interpretable image properties underlying model-brain similarity with generative models. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

9. Passi A, Kazemian A, & **Bonner MF**. Spatial filters in neural network models of visual cortex do not need to be learned. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

10. Robinson B, Drenkow N, Conwell C, & **Bonner MF**. Sparse null codes emerge and dominate representations in deep neural network vision models. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

11. McMahon E, Conwell C, Garcia K, **Bonner MF**, & Isik L. Language model prediction of visual cortex responses to dynamic social scenes. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

12. Townley K & **Bonner MF**. Investigating power laws in neural network models of visual cortex. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

13. Chen R & **Bonner MF**. How to estimate noise ceilings for computational models of visual cortex. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

14. Han C & **Bonner MF**. High-dimensional latent manifolds as predictors of individual differences in naturalistic movie viewing. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

15. **Bonner MF** & Conwell C. Geometric properties of object manifolds in neural network models of visual cortex. *Vision Sciences Society*, St. Pete Beach, FL, May 2024

16. Gauthaman RM, Ménard B & **Bonner MF**. Revealing the high-dimensional latent structure in visual cortical representations. *Conference on Cognitive Computational Neuroscience*, Oxford, UK, August 2023

17. Chen Z & **Bonner MF**. Canonical dimensions of vision. *Conference on Cognitive Computational Neuroscience*, Oxford, UK, August 2023

18. Kazemian A, Elmoznino E & **Bonner MF**. High-dimensional sampling in random neural networks competes with deep learning models of visual cortex. *Conference on Cognitive Computational Neuroscience*, Oxford, UK, August 2023

19. Gauthaman RM, Ménard B & **Bonner MF**. Understanding the high-dimensional nature of visual cortex representations. *Vision Sciences Society*, St. Pete Beach, FL, May 2023

20. Qu C, **Bonner MF** & Brannon EM. Contextual coherence increases perceived numerosity independent of semantic content. *Vision Sciences Society*, St. Pete Beach, FL, May 2023

21. Elmoznino E & **Bonner MF**. Latent dimensionality scales with the performance of deep learning models of visual cortex. *Conference on Cognitive Computational Neuroscience*, San Francisco, CA, August 2022

22. Li SPD & **Bonner MF**. Interpretable neural network models of visual cortex - A scattering transform approach. *Conference on Cognitive Computational Neuroscience*, San Francisco, CA, August 2022

23. Kazemian A, Elmoznino E & **Bonner MF**. Do We Need Deep Learning? Towards High-Performance Encoding Models of Visual Cortex Using Modules of Canonical Computations. *Conference on Cognitive Computational Neuroscience*, San Francisco, CA, August 2022

24. Gauthaman RM & **Bonner MF**. How much do we know about visual representations? Quantifying the dimensionality gap between DNNs and visual cortex. *Conference on Cognitive Computational Neuroscience*, San Francisco, CA, August 2022

25. McMahon E, **Bonner MF** & Isik L. Latent dimensionality scales with the performance of deep learning models of visual cortex. *Conference on Cognitive Computational Neuroscience*, San Francisco, CA, August 2022

26. Li SPD & **Bonner MF**. An interpretable alternative to convolutional neural networks: the scattering transform. St. Pete Beach, FL, May 2022

27. McMahon E, **Bonner MF** & Isik L. Naturalistic two-person social perception in the brain. *Vision Sciences Society*, St. Pete Beach, FL, May 2022

28. Han C & **Bonner MF**. Quantifying the latent semantic content of visual representations. *Vision Sciences Society*, Virtual Event, May 2021

    - Selected for a travel award

29. Elmoznino E & **Bonner MF**. High-performing computational models of visual cortex are marked by high intrinsic dimensionality. *Vision Sciences Society*, Virtual Event, May 2021

    - Selected for a travel award

30. Lin F, Zhang Y & **Bonner MF**. Boundary extension and contraction are predicted by the natural statistics of images. *Vision Sciences Society*, Virtual Event, May 2021

31. Nandiwada N, Magri C & **Bonner MF**. The stuff of natural scenes: probing human property judgments of textures, materials, and other amorphous scene components with convolutional neural networks. *Vision Sciences Society*, Virtual Event, May 2021

32. McMahon E, **Bonner MF** & Isik L. A large-scale, naturalistic dataset of two-person social actions. *Vision Sciences Society*, Virtual Event, May 2021

33. Li SPD & **Bonner MF**. Curvature as an Organizing Principle of Mid-level Visual Representation: A Semantic-preference Mapping Approach. *Workshop on Shared Visual Representation in Human & Machine Intelligence at NeurIPS*, Virtual Event, December 2020

34. Elmoznino E & **Bonner MF**. Visual representations derived from multiplicative interactions. *Workshop on Shared Visual Representation in Human & Machine Intelligence at NeurIPS*, Virtual Event, December 2020

35. Hafri AA, Wadhwa S, & **Bonner MF**. "Honey, I shrunk the scene": Perceived spatial scale alters memory for scene boundaries. *Object Perception, Attention, & Memory*, Virtual Event, November 2020

36. DeWind NK, **Bonner MF**, Muracca C, & Brannon EM. Coherent arrays appear more numerous. *The Mathematical Cognition and Learning Society Annual Conference*, Dublin, Ireland, June 2020

37. Hafri AA, **Bonner MF**, Landau B, & Firestone C. Visual predictions from physical relations. *Vision Sciences Society*, St. Pete Beach, FL, June 2020

38. **Bonner MF** & Epstein RA. Parahippocampal cortex represents the natural statistics of object context. *Vision Sciences Society*, St. Pete Beach, FL, May 2019

39. Metzgar RC, **Bonner MF** & Epstein RA. What lies beyond: Representations of the connectivity structure of the local environment. *Vision Sciences Society*, St. Pete Beach, FL, May 2019

40. Dwivedi K, **Bonner MF** & Roig G. Explaining Scene-selective Visual Areas Using Task-specific Deep Neural Network Representations. *Conference on Cognitive Computational Neuroscience*, Berlin, Germany, September 2019

41. Dwivedi K, **Bonner MF** & Roig G. Explaining scene-selective visual areas using task-specific and category-specific DNN units. *Vision Sciences Society*, St. Pete Beach, FL, May 2019

42. **Bonner MF** & Epstein RA. How are the statistics of object co-occurrence represented in cortex? *Society for Neuroscience*, San Diego, CA, November 2018

43. Hafri AA**, Bonner MF**, Trueswell JC & Epstein RA. Brains on books: Event-structure semantics predict cortical responses to naturalistic language. *Society for Neuroscience*, San Diego, CA, November 2018

44. **Bonner MF** & Epstein RA. How are the statistics of object co-occurrence represented in human visual cortex? *Conference on Cognitive Computational Neuroscience,* Philadelphia, PA, September 2018

45. Harel A, Nador JD, **Bonner MF** & Epstein, RA, (2018). Early electrophysiological markers of navigational affordances in scenes. *Vision Sciences Society*, St. Pete Beach, FL, May 2018

46. **Bonner MF** & Epstein RA. Computational mechanisms underlying fMRI responses to affordance properties in visual scenes. *Conference on Cognitive Computational Neuroscience*, New York, NY, September 2017

47. **Bonner MF** & Epstein RA. Coding of navigational affordances in the human visual system. *Statistical Analysis of Neural Data Workshop*, Pittsburgh, PA, June 2017

48. **Bonner MF** & Epstein RA. Computational mechanisms for identifying the navigational affordances of scenes in a deep convolutional neural network. *Vision Sciences Society*, St. Pete Beach, FL, May 2017

49. Price AR, **Bonner MF**, Peelle JE & Grossman M. A common, fine-grained code for object meaning in perirhinal cortex. *Society for Neuroscience*, San Diego, CA, November 2016

50. Price AR, **Bonner MF**, Peelle JE & Grossman M. Intersubject similarity of multivoxel codes in perirhinal cortex reflects the typicality of visual objects. *Vision Sciences Society*, St. Pete Beach, FL, May 2016

51. **Bonner MF**, Ryan J & Epstein RA. Neural coding of navigational affordances in visual scenes. *Society for Neuroscience*, Chicago, IL, October 2015

52. Price AR, Peelle JE, **Bonner MF**, Grossman M & Hamilton RH. Altering mechanisms of combinatorial semantics through brain stimulation to the angular gyrus. *Society for the Neurobiology of Language*, Chicago, IL, October 2015

53. **Bonner MF**, Ryan J & Epstein RA. Neural coding of navigational affordances in the local visual environment. *Vision Sciences Society*, St. Pete Beach, FL, May 2015

54. **Bonner MF**, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Society for the Neurobiology of Language*, Amsterdam, Netherlands, August 2014

55. Price AR, **Bonner MF**, Peelle JE & Grossman M. Modulating conceptual combination using focal non-invasive brain stimulation. *Society for the Neurobiology of Language*, Amsterdam, Netherlands, August 2014

56. **Bonner MF**, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Cold Spring Harbor Laboratory Symposium on Cognition*, Cold Spring Harbor, NY, May 2014

57. **Bonner MF**, Peelle JE, Price AR & Grossman M. Individual variability in a cortical semantic hub. *Cognitive Neuroscience Society*, Boston, MA, April 2014

    - Selected for a postdoctoral-fellows award

58. **Bonner MF**, Peelle JE, Price AR & Grossman M. Structural variability in a large-scale cortical network that relates to individual differences in language performance. *Society for Neuroscience,* San Diego, CA, November 2013

59. **Bonner MF**, Peelle JE, Cook P & Grossman M. The angular gyrus supports heteromodal semantic representations. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

60. Price AR, **Bonner MF**, Peelle JE & Grossman M. Conceptual combination in the angular gyrus. *Society for the Neurobiology of Language*, San Sebastian, Spain, October 2012

61. **Bonner MF**, Price AR, Peelle JE & Grossman M. Semantic retrieval recruits heteromodal regions and modality-specific association cortices. *Cognitive Neuroscience Society*, Chicago, IL, April 2012

62. Price AR, **Bonner MF**, Peelle JE & Grossman M. When concepts combine: semantic processing in the angular gyrus. *Cognitive Neuroscience Society*, Chicago, IL, April 2012

63. **Bonner MF** & Grossman M. When concepts go quiet: Reduced gray matter in auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Society for Neuroscience*, Washington D.C., November 2011

64. Price AR, **Bonner MF**, Peelle JE & Grossman M. The representations of sensory-motor word features during a semantic association task. *Society for Neuroscience*, Washington D.C., November 2011

65. **Bonner MF** & Grossman M. When concepts go quiet: Reduced gray matter in auditory association cortex relates to knowledge of sound concepts in primary progressive aphasia. *Society for the Neurobiology of Language*, Annapolis, MD, November 2011

66. Price AR, **Bonner MF**, Peelle JE & Grossman M. The representations of sensory-motor word features during a semantic association task. *Society for the Neurobiology of Language*, Annapolis, MD, November 2011

67. **Bonner MF**, Peelle JE & Grossman M. The role of angular gyrus and sensory-motor association cortices in representing word meanings: An fMRI study. *Cognitive Neuroscience Society*, San Francisco, CA, April 2011

68. Price AR, **Bonner MF**, Peelle JE & Grossman M. Word associations involve modality-specific cortices. *Cognitive Neuroscience Society*, San Francisco, CA, April 2011

69. **Bonner MF** & Grossman M. Sound, sight and action in meaning: fMRI evidence of word representations in perceptual and motor cortices. *Society for Neuroscience*, San Diego, CA, November 2010

70. Dreyfuss M, Smith EE, McMillan C, Gunawardena D, Richmond L, **Bonner MF** & Grossman M. Neural representation of word meaning: an fMRI study. *Society for Neuroscience*, San Diego, CA, November 2010

71. Grossman M, Smith EE, Gunawardena DE, Dreyfuss M, Richmond L, **Bonner MF** & McMillan C. Neural representation of word meaning in healthy seniors: an fMRI study. *Society for Neuroscience*, San Diego, CA, November 2010

72. **Bonner MF** & Grossman M. Sound, sight and action in meaning: fMRI evidence of word representations in perceptual and motor cortices. *Neurobiology of Language Conference*, San Diego, CA, November 2010

73. Dreyfuss M, Smith EE, McMillan C, Gunawardena D, Richmond L, **Bonner MF** & Grossman M. Neural representation of word meaning: an fMRI study. *Neurobiology of Language Conference*, San Diego, CA, November 2010

74. Grossman M, Smith EE, Gunawardena DE, Dreyfuss M, Richmond L, **Bonner MF** & McMillan C. Neural representation of word meaning in healthy seniors: an fMRI study. *Neurobiology of Language Conference*, San Diego, CA, November 2010

75. **Bonner MF** & Grossman M. Turning down the volume on semantics: Impaired knowledge of sound words in logopenic progressive aphasia. *Cognitive Neuroscience Society*, Montreal, Canada, April 2010

76. **Bonner MF**, Vesely L, McMillan C, Avants B & Grossman, M. Reversal of the concreteness effect for verbs in semantic dementia. *Neurobiology of Language Conference*, Chicago, IL, October 2009

77. Farag C, McCluskey L, Elman L, Goldmann Gross R, **Bonner MF** & Grossman M. Insensitive to hierarchy: ALS and FTD display overlapping executive impairment. *American Academy of Neurology*, Seattle, WA, April 2009

78. Vesely L, **Bonner MF**, Reilly J & Grossman M. Free association in semantic dementia: The importance of being abstract. *Academy of Aphasia*, Washington D.C., October 2007

INVITED TALKS

2025. Janelia Research Campus, Computation & Theory Speaker Series

2025. Keynote at Vision Sciences Society workshop on The AI Revolution in Vision Science

2025. University of Miami, Department of Psychology

2025. Cognitive Neuroimaging Unit, NeuroSpin, Frédéric Joliot Institute for Life Sciences

2024. Conference on Cognitive Computational Neuroscience, Battle of the Metrics Event

2024. Northeastern University, Center for Cognitive and Brain Health

2024. University of Delaware, Interdisciplinary Neuroscience Seminar

2024. Johns Hopkins University, Kavli Neuroscience Discovery Institute

2023. UC Santa Barbara, Kavli Institute for Theoretical Physics, Program on Deep Learning from the Perspective of Physics and Neuroscience

2023. University of Pennsylvania, MindCORE Seminar

2023. Keynote at Conference on Cognitive Computational Neuroscience

2022. Lieber Institute for Brain Development

2021. National Institutes of Mental Health, Laboratory of Brain and Cognition

2021. Johns Hopkins University, Mind/Brain Institute

2020. Johns Hopkins University, Science of Learning Institute

2019. Keynote at BlackboxNLP Workshop, Association for Computational Linguistics

2019. Johns Hopkins University, Computational Cognitive Science Seminar

2019. Johns Hopkins University, Introduction to Biomedical Research and Careers

2016. University of Pennsylvania, Behavioral & Cognitive Neuroscience Retreat

2014. University of Pennsylvania, Theatre Arts Program

2014. Harvard University, Concepts Seminar

2014. Temple University, Cognitive Neuroscience Lab

2013. Washington University in St. Louis, Department of Psychology,

2011. University of Pennsylvania, Center for Cognitive Neuroscience Colloquium

AWARDS AND HONORS

JHU Institute for Data Intensive Engineering and Science Seed Funding	2024
JHU Catalyst Award	2023
Postdoctoral Fellows Award, Cognitive Neuroscience Society	2014
Abstract Award for Concepts, Actions, and Objects Workshop	2013
NIH T32 Neuroimaging Trainee	2009-2012
Judy Lee Writing Award, Penn Creative Writing Program	2007
Discovery Summer Research Grant, Pennsylvania State University	2005
Shigley Scholarship in Biochemistry, Pennsylvania State University	2004-2005
Frank Thomson Scholarship	2000-2004
Dean's Honor List, Pennsylvania State University	2001-2005

GRANTS

Submitted Applications

NSF CAREER, 260587 — PI $795,118
Geometric and computational principles of high-level vision in humans and AI

Toffler Scholar Program — PI $25,000
A new high-dimensional neuroscience of the human brain

Awarded

Humboldt Experienced Researcher Fellowship — PI
Understanding the statistical structure of high-level human vision

JHU IDIES Seed Funding (2024-2025) — PI $25,000
Exploring uncharted dimensions of human brain representation

R01, NIH R01MH132826 (2023-2028) — Co-I (PI: Isik) $3,115,834
The neural computations underlying human social interaction recognition

JHU Catalyst Award (2023-2024) — PI $75,000
Canonical representations of artificial and biological vision

ADVISING

Postdoctoral Fellows

Colin Conwell (2023-2024, AI start up)

Alon Hafri (2019-2022, Assistant Professor, University of Delaware)

Caterina Magri (2020-2021, Research Scientist at Google)

PhD Students

Ananya Passi (current)

Ray Chen (current)

Yash Mehta (current)

Kelsey Han (current)

Raj Magesh Gauthaman (current)

Emalie McMahon (2019-2024, Postdoctoral Fellow, MIT)

Donald Li (2019-2021, Visiting Assistant Professor, Johns Hopkins)

MA Students

Tailai Shen (2023-2024, PhD student, UC Irvine)

Rosie Catron (2023-2024)

Yingqi Rong (2023-2024)

Ray Chen (2022-2023, PhD student, JHU)

Keaton Townley (2022-2023)

Atlas Kazemian (2021-2022, PhD student, Stanford)

Shreya Wadhwa (2021, Google)

Wanyi Guo (2020-2021, Lab Manager, Northwestern University)

Feikai Lin (2019-2020, PhD student, McGill)

Eric Elmoznino (2019-2020, PhD student, Mila)

Yiyuan Zhang (2019-2020, PhD student, Boston College)

Undergraduate Research

Mya Watson (2022)

Shreya Wadhwa (2020-2021)

- Recipient of *Provost's Undergraduate Research Award*
- Recipient of the *Glushko Outstanding Undergraduate Cognitive Scientist Prize*

Adyant Balaji (2020)

Ajaykarthik Ananthakrishnan (2019-2021)

Neha Nandiwada (2019-2021)

Jiayu Shao (JHU Class of 2021, Postbaccalaureate IRTA trainee at NIMH)

Chris Song (JHU Class of 2019, Deloitte Consulting)

TEACHING

Cracking the code: Theory and modeling of information coding in neural activity (JHU, AS.050.365 & AS.050.665)	2020-present
Neuroscience: Cognitive (JHU, AS.050.203)	2019-present
Seminar in Cognitive Neuroscience and Machine Learning (JHU, AS.050.806)	2019-present

SERVICE

University Service – Johns Hopkins University

Neuroscience undergraduate program committee	2024-present

Departmental Service – Johns Hopkins University

Faculty Search Committee	2024
Colloquium Chair	2020-present
Early Career Colloquium Committee	2024
Department Representation Committee	2020-present
Faculty Search Committee	2023
Provost's Undergraduate Research Award Reviewer	2019
Brown Bag Seminar Coordinator	2019, 2025
Brain Sciences Panel, Office of Undergraduate Admissions	2019

JHU Graduate Board Oral Exams and Dissertation Committees

Rohit Kumar (JHU Electrical and Computer Engineering)	2025
Yu-Jeh Liu (JHU Electrical and Computer Engineering)	2025
Prakhar Kaushik (JHU Computer Science)	2025
Qihan Wu (JHU Psychological and Brain Sciences)	2025
Zihao Xiao ((JHU Computer Science)	2024
Jiengen Chen ((JHU Computer Science)	2024
Yutong Bai ((JHU Computer Science)	2024
Angtian Wang (JHU Computer Science)	2023
Jieru Mei (JHU Computer Science)	2023
Natalia Talmina (JHU Cognitive Science)	2023
Suhas Arehali (JHU Cognitive Science)	2023
Teresa Huang (JHU Applied Mathematics)	2023
Nathan Drenkow (JHU Computer Science)	2023
Zekun Sun (JHU Psychological and Brain Sciences)	2023
Chenglin Yang (JHU Computer Science)	2023
Hongru Zhu (JHU Cognitive Science)	2022
Matthias Lalisse (JHU Cognitive Science)	2021
Celia Litovsky (JHU Cognitive Science)	2021
Siyuan Qiao (JHU Computer Science)	2021

Yingwei Li (JHU Computer Science)	2021
Li Guo (JHU Psychological and Brain Sciences)	2020
Pang Chaisilprungraung (JHU Cognitive Science)	2020
Qing Liu (JHU Computer Science)	2020
Giulia Elli (JHU Psychological and Brain Sciences)	2019

PhD Project Committees

Hannah Small (JHU Cognitive Science)	2024
Kathy Garcia (JHU Cognitive Science)	2024
Manasi Malik (JHU Cognitive Science)	2022, 2024
Paul Soulos (JHU Cognitive Science)	2021
Kyriaki Neophytou (JHU Cognitive Science)	2020
Celia Litovsky (JHU Cognitive Science)	2020
Pang Chaisilprungraung (JHU Cognitive Science)	2020
Nicole Dickerson (JHU Cognitive Science)	2019

External Service

External Advisor for Individual Studies Program (University of Maryland)	2022-2023

Peer Review

Ad Hoc Reviewer – Journals

Brain and Language, Cerebral Cortex, Cognitive and Behavioral Neurology, Cognitive, Science, Cortex, Current Biology, Journal of Cognitive Neuroscience, Journal of Neuroscience, Nature, NeuroImage, Neuron, PLOS Computational Biology, PNAS, Psychology Press, Scientific Reports, TICS

Ad Hoc Reviewer – Annual Conferences

Conference on Cognitive Computational Neuroscience

Ad Hoc Reviewer – Grants

Biotechnology and Biological Sciences Research Council, UK

EDITORIAL POSITIONS

Journal of Cognitive Neuroscience — Consulting Editor

PUBLIC ENGAGEMENT

Virtual Information Session on PhD Applications in Cognitive Science 2020
Information session open to the public for aspiring PhD applicants

Science In Action Program, Johns Hopkins University 2019
Presentation and lab tour for educators

Career day at Northwood Academy Charter School, Philadelphia, PA 2014
Presentation on neuroscience research careers

Public event on the science of sound, with Pig Iron Theatre Company 2014
Discussion panel member

Penn Neuroscience Boot Camp, University of Pennsylvania 2011
Breakout session leader