

# MARK HAMILTON

CS PhD Candidate at MIT and Senior Engineering Manager at Microsoft

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## EDUCATION

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**Massachusetts Institute of Technology** 2019-Present  
Ph.D Student in Computer Science, NSF GRFP Fellow GPA: 5.0/5.0  
Thesis: *Unsupervised Structure Discovery with Foundation Models* Advisor: William T Freeman

**Yale University** 2012 - 2016  
Bachelors of Science in Mathematics and Physics with Distinction Magna Cum Laude, GPA: 3.9/4.0  
Thesis: *Language Independent Automated Theorem Proving* Advisor: Gregg Zuckerman

## SELECTED WORK EXPERIENCE

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**Microsoft New England Research and Development** Cambridge, MA  
*Senior Engineering Manager* 2024 - Current  
*Senior Software Engineer* 2016 - 2024

Lead the SynapseML team that builds distributed ML algorithms and products for Microsoft's largest databases. SynapseML supports thousands of production ML workflows monthly.

**5.1k stars, 123 contributors, 4M downloads.** Website: <https://aka.ms/spark>

## SELECTED PUBLICATIONS

[SEE ALL 38 PUBLICATIONS](#) ↗

- [Hamilton MT](#), Hershey J., Zisserman A., Freeman W. *Separating the “Chirp” from the “Chat”: Self-supervised Visual Grounding of Sound and Language.* Computer Vision and Pattern Recognition (CVPR) 2024
- [Hamilton MT\\*](#), Fu S.\*, et.al. *FeatUp: A Model-Agnostic Framework for Features at Any Resolution.* International Conference on Learning Representations (ICLR) 2024
- [Hamilton MT](#), et.al. *Seeing Faces in Things: A Model and Dataset for Pareidolia.* European Conference on Computer Vision 2024
- [Hamilton MT\\*](#), Walsh B\*, et. al. *Large-Scale Automatic Audiobook Creation .* INTERSPEECH Show and Tell 2023. **TIME Top 200 Invention of 2023**
- [Hamilton MT](#), Zhang Z, Hariharan B, Snavely N, Freeman W. *Unsupervised Semantic Segmentation by Distilling Feature Correspondences.* ICLR, 2022
- [Hamilton MT](#), Lundberg S, Zhang L, Fu S, Freeman W. *Axiomatic Explanations for Visual Search, Retrieval, and Similarity Learning.* ICLR, 2022

## RECENT AWARDS

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2023	Winner	TIME Top 200 Inventions of 2023
2022	Winner	MIT CSAIL Alliances Student Spotlight
2021	Winner	NSF Graduate Research Fellowship
2021	Winner (\$60k)	Systems That Learn Fellowship
2020	Winner (\$100k)	Systems That Learn Fellowship
2019	Distinguished Speaker	IEEE High Performance Extreme Computing
2019	Editors Choice Article	American Chemical Society
2019	Cover Article	Environmental Science and Technology
2016	Winner	Howard L. Schultz Prize for Experimental Physics

## TEACHING

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### Modern Deep Learning

2016-2017

~ 200 *Students, Microsoft New England Research and Development*

Cambridge, MA

Created and taught a 14 week course on deep learning theory and applications. Topics covered: network architectures (FF, RNN, Conv, ResNet, LSTM), network inversion, Deep Dream, distribution metrics (MMD, EMD, etc), GANs, information theory/geometry, language models and embeddings, stochastic matrix factorization, deep reinforcement learning, deep-q learning, Alpha Go, Neural Turing Machines, optimization methods, optical flow.

Syllabus: <https://mhamilton.net/files/mdls.pdf>

## LEADERSHIP

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I have advised and supervised over **65 people** in my career. I currently lead a team of **3 engineers at Microsoft** and am mentoring **8 students at MIT**.

### Direct Reports

Current 3 Engineers *SynapseML Core Team*

### Workshop Organizing

2023 Chair *CVPR Workshop on Multimodal Learning for Earth and Environment*

2022 Chair *CVPR Workshop on Multimodal Learning for Earth and Environment*

### PhD Students

Current 1 Student *Automating Scientific Literature Review*

Current 1 Student *Project Gutenberg Open Audiobook Collection v2*

Current 1 Student *A Gradient-based Shapley Value Estimator*

### Masters Students

Current 1 Student *Unifying Representation Learning*

Current 1 Student *Improving Contrastive Batch Sizes by 1000×*

Current 1 Student *Dolphin Whistle Detection from Hydrophone Audio*

2022 1 Student *Unsupervised Learning for Remote Sensing*

### Undergraduate Students

Current 1 Student *Equivariant Contrastive Learning*

Current 1 Student *Integrating Feedforward Inference and Analysis-by-Synthesis*

2022 1 Student *Upsampling Deep Vision Backbones*

2022 1 Student *Exploring Gender and Race Biases in the NFT Market*

2021 1 Student *Deep Independent Component Analysis*

### Tech Leadership

Current 1 Engineer *Simplifying Large Scale LLM Use on Apache Spark*

2022 6 Engineers *SynapseML vTeam*

2021 6 Engineers *Cross-Cloud Benchmarking of Distributed Algorithms*

2018 6 Engineers *Distributing Custom Search Engine Creation*

2018 6 Engineers *Unsupervised Object Detection for Individual Snow Leopard Identification*

### Interns

2020 8 Interns *Conditional KNNs for Cross Cultural Art Discovery*

2020 1 Intern *Distributed Speech to Text*

2019 7 Interns *Deep Learning for Cultural Institutions*

2019 5 Interns *Gen Studio: A Deep Art Experience for the Metropolitan Museum of Art*

2017 1 Intern *Distributing Tensorflow on Spark*

2017 1 Intern *Automating Energy Meter Quality Assurance with SSD Networks*

2017 2 Interns *Deploying Spark on Azure Kubernetes Service*

2016 1 Intern *Implementing Grid LSTMs in the Cognitive Toolkit*

## SELECTED PRESS

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2024 Science Mag.	<a href="#">🔗 <i>Imagining Faces in Tree Trunks and Your Morning Eggs? AI Can See Them Too</i></a>
2024 MIT News	<a href="#">🔗 <i>AI Pareidolia: Can Machines Spot Faces in Inanimate Objects?</i></a>
2023 TIME Mag.	<a href="#">🔗 <i>The Best Inventions of 2023</i></a>
2023 Forbes	<a href="#">🔗 <i>Project Gutenberg Uses AI To Produce 35,000 Hours Of Audiobooks</i></a>
2023 Popular Science	<a href="#">🔗 <i>AI Is Learning to Read Audiobooks With a Natural Human-Like Voice</i></a>
2023 Financial Times	<a href="#">🔗 <i>The promise — and peril — of generative AI</i></a>
2021 The Yomiuri Shim-bun	<a href="#">🔗 <i>Image synthesis made easy with AI</i></a>
2020 Smithsonian Mag.	<a href="#">🔗 <i>How an Algorithm Creates Unlikely Pairings of Classic Art</i></a>
2020 Artnet	<a href="#">🔗 <i>MIT's New AI Curator 'Mosaic' Is Helping Museums Discover Hidden Connections in Their Collections</i></a>
2020 Comm. of the ACM	<a href="#">🔗 <i>Algorithm Finds Hidden Connections Between Paintings at the Met</i></a>
2020 The Times	<a href="#">🔗 <i>AI Curator Inspired by Visit to Rijksmuseum Can Find Links Between Works of Art</i></a>
2019 Nat. Acad. Press	<a href="#">🔗 <i>Management of Legionella in Water Systems</i></a>
2024 AAAS EurekAlert	<a href="#">🔗 <i>What is clean breathing water?</i></a>
2019 Wall Street Journal	<a href="#">🔗 <i>Metropolitan Museum of Art Employs AI as Tool of Engagement</i></a>
2018 TIME	<a href="#">🔗 <i>How Drones Are Fighting Poachers to Protect Endangered Animals</i></a>
2018 GeekWire	<a href="#">🔗 <i>Microsoft Says AI Is Finally Ready for Broader Use to Help Solve Earth's Environmental Woes</i></a>

## LANGUAGES AND SOFTWARE

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### Languages

- **Scientific:** Python, R, Matlab, Mathematica
- **Functional and Object Oriented:** Scala, Java, C#
- **Scripting:** Bash, CMD, Powershell
- **Web:** Javascript, Typescript, HTML, CSS
- **Native:** C++, C

### Software

- **Deep Learning:** PyTorch, Pytorch Lightning, Tensorflow, Horovod, Keras, Theano, CNTK
- **LLMs:** Langchain, Azure OpenAI, HuggingFace
- **Distributed Computing:** Spark, Kubernetes, Azure Databricks, Microsoft Fabric, Synapse Analytics, CosmosDB, HDInsight, TORQUE, Azure Blob, Azure Data Lake, Virtual Kubelet, Azure Container Instances
- **Machine Learning and Scientific Computing:** Scikit-Learn, SparkML, NLTK, Azure ML, Azure Cognitive Services, Numpy, Pandas
- **Probabilistic Programming:** Pyro, pyMC2/3, MC2D, Edward
- **Engineering:** Azure Pipelines, Github Actions, Docker, Kubernetes, IntelliJ, PyCharm, VSCode, Git, SSH, RDP, Certificates, VPN Gateways, Gradio, Web Serving, Web Clients, Helm, SWIG, JNI, SBT, Maven, Sockets, HTTP, Container Registries, Visual Studio
- **Publishing:** React, WebFlow, L<sup>A</sup>T<sub>E</sub>X, GIMP, InkScape

## RELEVANT COURSEWORK

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Machine Learning	Statistics	Linear Algebra
Computer Vision	Information Theory	Distributed Systems
Shape Analysis + Geometry	Neural Networks	Probabilistic Graphical Models
Vector Analysis	Abstract Algebra	Real Analysis
Complex Analysis	Multivariable Calculus	Complex Systems
Classical Physics	Quantum Physics	Particle Physics and Field Theory

## ALL PUBLICATIONS

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- Alshammari S., [Hamilton MT](#), Hershey J., Feldmann A., Freeman W. T. *I-Con: A Unifying Framework for Representation Learning*. In Review, International Conference on Learning Representations (ICLR), 2025.
- [Hamilton MT](#)\*, Vendrow E.\*, Rao G., Julian T., Brown J., Beery S., Freeman W. T., Hamilton K. *Automating Systematic Literature Reviews in Environmental Health*. Manuscript in preparation, 2025.
- Heida A., [Hamilton MT](#), Gambino J., Sanderson K., Schoen M., Jahne M., Garland J., Ramirez L., Quon H., Lopatkin A., Hamilton K. *A population ecology-quantitative microbial risk assessment (QMRA) model for antibiotic-resistant and susceptible E. coli in recreational water*. Environmental Science & Technology, Manuscript in review, 2024.
- [Hamilton MT](#), Hershey J., Zisserman A., Freeman W. *Separating the “Chirp” from the “Chat”: Self-supervised Visual Grounding of Sound and Language*. Computer Vision and Pattern Recognition (CVPR) 2024
- [Hamilton MT](#)\*, Fu S.\*, et.al. *FeatUp: A Model-Agnostic Framework for Features at Any Resolution*. International Conference on Learning Representations (ICLR) 2024
- [Hamilton MT](#), et.al. *Seeing Faces in Things: A Model and Dataset for Pareidolia*. European Conference on Computer Vision 2024
- Harrington A., DuTell V., [Hamilton MT](#), et. al. *COCO-Periph: Bridging the Gap Between Human and Machine Perception in the Periphery*. ICLR 2024
- DuTell V., Kovesdi C., Harrington A., [Hamilton MT](#), Freeman W. T., Rosenholtz R. *GramStatTexNet: Using the Gram Matrix of Multi-Scale Pyramids to Contrastively Learn Texture Model Statistics*. Journal of Vision, 24(10):1508–1508, 2024.
- [Hamilton MT](#)\*, Walsh B\*, et. al. *Large-Scale Automatic Audiobook Creation*. INTERSPEECH Show and Tell 2023. **TIME Top 200 Invention of 2023**
- Cha M, Angelides G., [Hamilton MT](#), Soszynski A., Swenson B., Maidel N., Isola P., Perron T., Freeman W. *MultiEarth 2023–Multimodal Learning for Earth and Environment Workshop and Challenge*. CVPR Workshop 2023
- Gadepally V., Angelides G., Barbu A., Bowne A., Brattain L.J., Broderick T., Cabrera A., Carl G., Carter R., [Hamilton MT](#), et al. *Developing a Series of AI Challenges for the United States Department of the Air Force*. 2022 IEEE High Performance Extreme Computing Conference (HPEC), 1–7, 2022, IEEE
- Zhong H., [Hamilton MT](#). *Exploring gender and race biases in the NFT market*. Finance Research Letters, 53, 103651, 2023, Elsevier
- Harrington A., DuTell V., Tewari A., [Hamilton MT](#), Stent S., Rosenholtz R., Freeman W.T. *Exploring the perceptual straightness of adversarially robust and biologically-inspired visual representations*. SVRHM Workshop at NeurIPS 2022

- Harrington A., DuTell V., Hamilton MT, Tewari A., Stent S., Freeman W.T., Rosenholtz R. *COCO-Periph: Bridging the Gap Between Human and Machine Perception in the Periphery*. In Review, International Conference on Learning Representations (ICLR) 2024
- Harrington A., DuTell V., Tewari A., Hamilton MT, Stent S., Rosenholtz R., Freeman W.T. *Exploring perceptual straightness in learned visual representations*. The Eleventh International Conference on Learning Representations (ICLR), 2022
- Harrington A., DuTell V., Hamilton MT, Tewari A., Stent S., Freeman W.T., Rosenholtz R. *Evaluating Peripheral Vision as an Input Transformation to Understand Object Detection Model Behavior*. NeurIPS Workshop on Gaze Meets ML 2023
- Koevesdi C., DuTell V., Harrington A., Hamilton MT, Freeman W.T., Rosenholtz R. *StatTexNet: Evaluating the Importance of Statistical Parameters for Pyramid-Based Texture and Peripheral Vision Models*. NeurIPS Workshop on Gaze Meets ML 2023
- Hamilton MT, Zhang Z, Hariharan B, Snavely N, Freeman W. *Unsupervised Semantic Segmentation by Distilling Feature Correspondences*. ICLR, 2022
- Hamilton MT, Lundberg S, Zhang L, Fu S, Freeman W. *Axiomatic Explanations for Visual Search, Retrieval, and Similarity Learning*. ICLR, 2022
- Hamilton MT, Fu S, Lu M, Bui J, Bopp D, Chen Z, Tran F, Wang M, Rogers M, Zhang L, Hoder C, Freeman W. *MosAIC: Finding Artistic Connections across Culture with Conditional Image Retrieval*. NeurIPS Competitions and Demonstrations, 2020
- Hamilton MT, Shelhamer E, Freeman W. *It's Likely Your Loss Should Be a Likelihood*. ICML Uncertainty in Deep Learning Workshop, 2022
- Hamilton MT, Gonsalves N, Lee C, Raman A, Walsh B, Prasad S, Banda D, Zhang L, Zhang L, Freeman WT. *Large Scale Intelligent Microservices* IEEE Big Data, 2020,
- Hamilton KA, Hamilton MT, Johnson D, Jjemba P, Bukhari Z, LeChevallier M, Haas CN, Gurian PL *Risk-based critical concentrations of Legionella pneumophila for indoor residential water uses*. **Editors Choice and Cover Article**, Environmental Science & Technology, 2019
- Heida A, Mraz A, Hamilton MT, Weir M, Hamilton KA. *Computational framework for evaluating risk trade-offs in costs associated with legionnaires' disease risk, energy, and scalding risk for hospital hot water systems*. Environmental Science: Water Research & Technology, 2022
- Hamilton MT, Raghunathan S., Matiach I., Schonhoffer A., Raman A., Barzilay E., Thigpen M., Rajendran K., Mahajan J.S., Cochrane C., and Eswaran A. *MMLSpark: Unifying Machine Learning Ecosystems at Massive Scales*. 2020. <https://arxiv.org/abs/1810.08744>
- Bondi E, Fang F, Hamilton MT, Kar D, Dmello D, Choi J, Hannaford R, Iyer A, Joppa L, Tambe M, Nevatia R. *Automatic Detection of Poachers and Wildlife with UAVs*. Artificial Intelligence and Conservation, 2020
- Bondi E, Fang F, Hamilton MT, Kar D, Dmello D, Choi J, Hannaford R, Iyer A, Joppa L, Tambe M, Nevatia R. *SPOT Poachers in Action: Augmenting Conservation Drones with Automatic Detection in Near Real Time*. Proceedings of the Thirtieth Annual Conference on Innovative Applications of Artificial Intelligence, 2018 <http://teamcore.usc.edu/papers/2018/spot-camera-ready.pdf>
- Hamilton MT, Raghunathan S, Annavajhala A, Kirsanov D, de Leon E, Barzilay E, Matiach I, Busch M, Oprescu M, Sur R, Astala R, Wen T, Park CY. *Flexible and Scalable Deep Learning with MMLSpark*. Proceedings of Machine Learning Research, 2017 <http://proceedings.mlr.press/v82/hamilton18a.html>

- Hamilton MT, Sur RR. *Massively Scalable Neural Networks with CNTK on Spark*. Microsoft Journal of Applied Research, 2017.
- Ananna TT, Salvato M, LaMassa S, Urry CM, Cappelluti N, Cardamone C, Civano F, Farrah D, Gilfanov M, Glikman E, Hamilton MT, Kirkpatrick A, Lanzuisi G, Marchesi S, Merloni S, Nandra K, Natarajan P, Richards G, Timlin J. *AGN Populations in Large Volume X-ray Surveys: Photometric Redshifts and Population Types found in the Stripe 82X Survey*. The Astrophysical Journal, 2017, <http://iopscience.iop.org/article/10.3847/1538-4357/aa937d/meta>
- Erickson E, Hamilton MT. *Companies and the Rise of Economic Thought: The Institutional Foundations of Early Economics in England, 1550 to 1720*. American Journal of Sociology, **Granovetter Best Paper Honorable Mention**, 2017 [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3075219](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3075219)
- Hamilton KA, Hamilton MT, Johnson W, Bukhari Z, Jjemba P, LeChevallier M, Haas CN. *Health risks from exposure to Legionella in reclaimed water aerosols: Toilet flushing, spray irrigation, and cooling towers*. Water Research, 2017 <https://mhamilton.net/files/water-research.pdf>
- Ahmed WA, Hamilton KA, Vieritz A, Powell D, Goonetilleke A, Hamilton MT, Gardner T. *Microbial risk from source-separated urine used as liquid fertilizer in sub-tropical Australia*. Microbial Risk Analysis, 2017, 5:53-64 <http://dx.doi.org/10.1016/j.mran.2016.11.005>
- Holland C., Hamilton MT, Samenez-Larkin G., *Heuristic Models Outperform Traditional Discounting Utility Models Across Multiple Discounting and Reward Types*. Society for Neuroeconomics, 2017 <https://mhamilton.net/files/neuroecon.pdf>
- Hamilton MT. *Semi-supervised translation using MMD networks*. <https://arxiv.org/abs/1810.11906>
- Hamilton MT, Rabe F, Kohlhase M, Zuckerman G. *Automated theorem proving in the module system for mathematical theories*. Accepted as a thesis for the B.S. in Mathematics and Physics, 2016, <https://mhamilton.net/files/thesis.pdf>
- Hamilton MT. *Category Theory and the Curry-Howard-Lambek Correspondence*. 2016, <https://mhamilton.net/files/chl.pdf>
- Hamilton MT. *Representations of the Heisenberg group and reproducing kernels*. 2016, <https://mhamilton.net/files/hkernel.pdf>
- Hamilton MT, Jia K, Cooke M, Golling T. *A study of the feasibility of a search for the single production of a vector-like top quark decaying to a Z boson and a top quark in pp collisions at  $\sqrt{s} = 8$  TeV with the ATLAS detector*. ATL-COM-PHYS-2014-474, 2014

## KEYNOTE PRESENTATIONS

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- Hamilton MT. *Separating the “Chirp” from the “Chat”: Self-supervised Visual Grounding of Sound and Language*. Speech and Audio in the Northeast 2024.
- Hamilton MT. *Scalable AI for Good*. Spark and AI Summit Europe 2019. Presented full keynote on Microsoft’s efforts in distributed machine learning for environmental conservation and cultural heritage.
- Kumar R, Hamilton MT. *Developing for the Intelligent Cloud and the Intelligent Edge*. Spark and AI Summit 2019. Built and presented keynote demo on unsupervised classification for helping people with visual impairments.
- Kumar R, Hamilton MT. *Developing for the Intelligent Cloud and the Intelligent Edge*. Spark and AI Summit Europe, London 2018. Built and presented keynote demo on unsupervised classification for Shell gas station hazard detection.

- Siros J, [Hamilton MT](#). *The Microsoft AI platform: a State of the Union*. Microsoft Build Conference, Seattle WA 2018. Built and presented keynote demo on interactive deep learning for Jabil Manufacturing circuit board defect detection.
- Kumar R, [Hamilton MT](#). *Developing for the Intelligent Cloud and the Intelligent Edge*. Spark and AI Summit, San Francisco CA 2018. Built keynote demo on realtime power grid maintenance detection with UAVs for eSmart Systems.
- Siros J, [Hamilton MT](#), Ren S, Thomas A, Smith B. *Day 1 Keynote*. Microsoft Machine Learning and Data Science Conference (MLADS), Seattle WA Summer 2018. Built and presented keynote demo on the Cognitive Services on Spark for endangered animal recognition.
- [Hamilton MT](#). *Flexible and Scalable Deep Learning with MMLSpark*. Keynote Speaker, International Conference on Predictive Applications and APIs, Boston MA 2017
- [Hamilton MT](#), Sengupta R. *Deep Learning for Snow Leopard Conservation*. Keynote Presentation, Microsoft AI for Earth Summit, Seattle WA May 2018.
- Siros J, [Hamilton MT](#). *How to Get Started with Microsoft AI*. Keynote Demo, Microsoft Connect(), New York, 2017. Built and presented keynote demo on high throughput distributed streaming systems for leopard classification
- [Hamilton MT](#). *Saving Snow Leopards with Azure Machine Learning*. Keynote Demo, Microsoft Machine Learning and Data Science Conference (MLADS), Seattle WA, Summer 2017. Built and presented keynote demo on elastic deep learning and programming by example for leopard classification.
- Siros J, [Hamilton MT](#). *Will AI help save the snow leopard?*. Built keynote demo of streaming leopard classifier. Strata Data Conference, New York 2017.

## ADDITIONAL TALKS

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- [Hamilton MT](#). *Separating the “Chirp” from the “Chat”: Self-supervised Visual Grounding of Sound and Language*. Large Scale Holistic Video Understanding Workshop at CVPR 2024.
- [Hamilton MT](#). *Separating the “Chirp” from the “Chat”: Self-supervised Visual Grounding of Sound and Language*. Sight and Sound Workshop at CVPR 2024.
- Jafari A., [Hamilton MT](#), Weimer M., Desai M. *Getting Started with ML & AI in Microsoft Fabric*. Microsoft Fabric Community Conference, 2024.
- [Hamilton MT](#), Xu R. *Elevate Data Transformation with AI: The Power of SynapseML in Microsoft Fabric*. Microsoft Fabric Community Conference, 2024.
- [Hamilton MT](#). *FeatUp: A Model-Agnostic Framework for Features at Any Resolution*. Microsoft Research 2023.
- [Hamilton MT](#). *Large-Scale Automatic Audiobook Creation*. Interspeech Show and Tell 2023.
- Juarez S, [Hamilton MT](#), Walsh B. *AI Show Live: Creating and Donating Thousands of AI-Powered Audiobooks to Project Gutenberg*. Microsoft AI Show, 2023.
- [Hamilton MT](#). *SynapseML OpenAI APIs and Integrations*. Microsoft Synapse Analytics Team 2023.
- [Hamilton MT](#). *Creating Scalable Custom Search Engines with SynapseML and OpenAI*. PwC ML Talk 2023.
- [Hamilton MT](#). *SynapseML: Simple and Distributed Machine Learning in Spark*. Intel Machine Learning Session 2023.
- Raman A, [Hamilton MT](#). *Working with AI Services at Scale*. ODSC Webinar Series, 2023.

- Gustafsson N., [Hamilton MT](#). *Massively Scalable Machine Learning on Spark with SynapseML*. Data Platform Summit, 2022.
- [Hamilton MT](#). *AI with SynapseML*. Global AI Podcast 2022.
- [Hamilton MT](#). *Introducing SynapseML*. ML.NET Community Standup 2022.
- [Hamilton MT](#). *SynapseML v1.0: Simple and Distributed Machine Learning*. Microsoft Spark Conference 2022. **Most Attended Talk of Conference**
- [Hamilton MT](#), et al. *MosAIC: Finding Artistic Connections across Culture with Conditional Image Retrieval* NuerIPS 2020 Competitions and Demonstrations.
- [Hamilton MT](#). *Discovering hidden connections in art with deep, interpretable visual analogies*, Microsoft Research Webinar, 2020.
- [Hamilton MT](#), et al. *Large-Scale Intelligent Microservices*, CSAIL Alliances Annual Meeting 2020.
- [Hamilton MT](#). *Microsoft ML for Apache Spark: Unifying Machine Learning Ecosystems at Massive Scales* **Distinguished Speaker** IEEE High Performance Extreme Computing 2019.
- [Hamilton MT](#). *Spark Serving: Unifying Batch, Streaming, and RESTful Serving*. Spark and AI Summit, San Francisco 2019.
- [Hamilton MT](#). *The Cognitive Services on Spark*. Machine Learning and Data Science Conference, 2019.
- [Hamilton MT](#). *The Azure Cognitive Services on Spark: Clusters with Embedded Intelligent Services*. Spark and AI Summit, San Francisco 2019.
- [Hamilton MT](#), Raman A. *Deep Reality Simulation For Automated Poacher Detection*. Spark and AI Summit Europe, London 2018.
- [Hamilton MT](#), Raman A. *Unsupervised Object Detection using the Azure Cognitive Services on Spark*. Spark and AI Summit Europe, London 2018.
- [Hamilton MT](#). *Unifying Microsoft's ML Ecosystems at Massive Scales with MMLSpark*. International Conference on Predictive Applications and APIs, Boston, 2018.
- Hamilton KA, [Hamilton MT](#), Johnson W, Bukhari Z, Jjemba P, LeChevallier M, Haas CN. *Evaluating the health risks from exposure to Legionella in reclaimed water aerosols*. Presentation and Conference proceedings for International Water Association International Conference on Water Reclamation and Reuse, 2017.
- Hamilton KA, [Hamilton MT](#), Haas CN, Johnson W, Bukhari Z, Jjemba P, LeChavallier M. *Health Risks from Legionella in reclaimed water aerosols produced by cooling towers and spray irrigation*. Association of Environmental Engineering and Science Professors Research and Education Conference, Ann Arbor, MI 2017
- Noelle LaCharite, George Earl, Shawn Roberts, [Hamilton MT](#). *Azure AI - developing with Azure Cognitive Services and Azure Bot Service*. Microsoft Ignite, Seattle WA 2018.
- [Hamilton MT](#). *Distributed AI for Earth: Using Microsoft's Open-Source Spark Ecosystem for Wildlife Conservation*. Apache Spark Developer Meetup Boston MA August 2018.
- [Hamilton MT](#). *Deep Reality Simulation for Automated Poacher Detection*. AI Collaboration to End Wildlife Trafficking Online Workshop, Redmond WA 2018.
- [Hamilton MT](#), et. al. *Deep Learning for Wildlife Conservation*. Conservation Asia. Bishkek Kyrgyzstan 2018.



- [Hamilton MT](#), Raman A. *Distributed Deep Domain Adaptation for Automated Poacher Detection*. O'Reilly Artificial Intelligence Conference, San Francisco CA, 2018.
- [Hamilton MT](#), Vankamandi S. *What's new in Azure Machine Learning*. Session, Microsoft Machine Learning and Data Science Conference (MLADS), Seattle WA, Summer 2017
- Pathak S, Siede F, [Hamilton MT](#). *Tutorial on Massively Scalable Production Grade Deep Learning with the Microsoft Cognitive Toolkit*. Full Day Workshop, International Conference on Information and Knowledge Management, Singapore, 2017
- [Hamilton MT](#), Wu H. *Using Spark and Computer Vision to Help Save Snow Leopards*. Taiwan Artificial Intelligence Annual Meeting, Taiwan 2017
- [Hamilton MT](#). *Introduction to Deep Learning*. Harvard University Psychology Dept. Cambridge MA, 2017
- [Hamilton MT](#). *Saving Snow Leopards with Deep Learning and Computer Vision on Spark*. Microsoft Machine Learning Community Talk Series, Online, 2017
- [Hamilton MT](#), Raghunathan S. *Deep Learning with the Microsoft Cognitive Toolkit and MMLSpark*. Boston Data Science Meetup, Cambridge MA, 2017
- [Hamilton MT](#). *Deep Learning for Unsupervised Translation*. SUMS Mathematics Society, Yale University 2016
- [Hamilton MT](#). *Algebraic Data Types*. SUMS Mathematics Society, Yale University 2016
- [Hamilton MT](#). *Categorical Biology*. SUMS Mathematics Society at Yale University 2016

## REFERENCES

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### **William T. Freeman (PhD Advisor)**

Thomas and Gerd Perkins Professor of Electrical Engineering and Computer Science (EECS) at MIT  
billf@mit.edu

### **Andrew Zisserman**

Professor of Computer Vision Engineering at Oxford and a Royal Society Research Professor.  
az@robots.ox.ac.uk

### **John Hershey**

Google AI Perception Researcher  
johnhershey@google.com

### **Simon Stent**

Researcher at Toyota Research Institute  
sistent@gmail.com

### **Sudarshan Raghunathan**

Software Engineer at Meta AI Platform  
rdarshan@gmail.com