Kenneth C. Arnold kcarnold@alum.mit.edu
Assistant Professor of Computer Science and Data Science kenarnold.org, 443-310-4002
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Education

Harvard University, Cambridge, MA USA
Ph.D., Computer Science May 2020
Research: Impacts of Predictive Text on Writing Content
Advisor: Krzysztof Z. Gajos, Intelligent Interactive Systems group

Massachusetts Institute of Technology, Cambridge, MA USA
S.M., Media Arts and Sciences (MIT Media Lab) February 2010
Research: natural-language code search, commonsense reasoning
Advisor: Henry Lieberman, Software Agents Group, MIT Media Lab

Cornell University, Ithaca, NY USA
B.S., Electrical and Computer Engineering, magna cum laude June 2007

Grants

CRII: HCC: Interactive Natural Language Technology for Supporting Writers in Structuring and Revising Documents. $175,000. 2023–2025.

Calvin Research Fellowship course releases (approx. $10,000 per year), 2020–2023.

Conference and Journal Papers

K.C. Arnold, K. Chauncey, and K.Z. Gajos. **Predictive text encourages predictable writing**. *IUI* 2020.

K.C. Arnold, K. Chauncey, and K.Z. Gajos. **Sentiment bias in predictive text recommendations results in biased writing**. *Graphics Interface* (GI) 2018.

K.C. Arnold, A. Kalai, and K.Z. Gajos. **On Suggesting Phrases vs. Predicting Words for Mobile Text Composition**. UIST 2016.

K.C. Arnold, K. Chang, and A. Kalai. **Counterfactual Language Model Adaptation for Suggesting Phrases**. IJCNLP 2017.

K.E. Boronow, H.P. Susmann, K.Z. Gajos, R.A. Rudel, K.C. Arnold, P. Brown, R. Morello-Frosch, L. Havas, J.G. Brody. **DERBI: a digital method to help researchers offer "right-to-know" personal exposure results**. Environmental health perspectives, vol. 125 no. 2, 2017.

K. Siangliulue, K.C. Arnold, K.Z. Gajos, and S. P. Dow. **Toward Collaborative Ideation at Scale: Leveraging Ideas from Others to Generate More Creative and Diverse Ideas**. CSCW 2015.

C-Z. Huang. D. Duvenaud, K.C. Arnold, B. Partridge, J.W. Oberholtzer, and K. Z. Gajos. **Active learning of intuitive control knobs for synthesizers using Gaussian processes**. IUI 2014.

K.C. Arnold and H. Lieberman. **Managing Ambiguity in Programming by Finding Unambiguous Examples**. *Object oriented programming systems languages and applications*, OOPSLA 2010.

K. Gold, C. Havasi, M. Anderson, and K.C. Arnold. **Comparing Matrix Decomposition Methods for Meta-analysis and Reconstruction of Cognitive Neuroscience Results**, *Florida Artificial Intelligence Research Society Conference*, FLAIRS 2011.

R. Speer, J. Krishnamurthy, C. Havasi, D. Smith, H. Lieberman, K.C. Arnold. **An interface for targeted collection of common sense knowledge using a mixture model**. IUI 2009.

N.E. Huang, Z. Wu, S.R. Long, K.C. Arnold, X. Chen, K. Blank. **On Instantaneous Frequency**. *Advances in adaptive data analysis*, vol 1 issue 2, Dec. 2009.

Posters and Workshop Papers

*Jiho Kim, *Ray C. Flanagan, *Noelle E. Haviland, *ZeAi Sun, *Souad N. Yakubu, *Edom A. Maru, and Kenneth C. Arnold. **Towards Full Authorship with AI: Supporting Revision with AI-Generated Views**. *IUI Workshop on Human-AI Co-Creation with Generative Models (HAI-GEN)*, 2024.

K.C. Arnold. **AI and Writing: Do we speak the words of stochastic parrots?**. *Journal and Proceedings of the Association of Christians in the Mathematical Sciences*, 2022.

K.C. Arnold, *A. M. Volzer, and *N. G. Madrid. **Generative Models can Help Writers without Writing for Them**. *IUI Workshop on Human-AI Co-Creation with Generative Models*, 2021.

K.C. Arnold and K.Z. Gajos. **Effective Interactions for Personalizing Spatial Visualizations of Collections**. *UIST 2015*.

K.C. Arnold and H. Lieberman. **Embracing Ambiguity**. *FSE/SDP Workshop on the Future of Software Engineering Research*, 2010.

K.C. Arnold and H. Lieberman. **Scruffy Cross-Domain Inference**. *AAAI Fall Symposium on Common Sense Knowledge*, 2010.

J.B. Alonso, K.C. Arnold, and C. Havasi. **Envisioning a Robust, Scalable Metacognitive Architecture Built on Dimensionality Reduction**. *AAAI-10 Workshop on Metacognition for Robust Social Systems*, 2010.

C. Havasi, R. Speer, K.C. Arnold, H. Lieberman, J. Alonso, J. Moeller. **Open Mind Common Sense: Crowd-sourcing for Common Sense**. *AAAI-10 Workshop on Collaboratively-Built Knowledge Sources and Artificial Intelligence*, 2010.

K.C. Arnold **Reusing Code by Reasoning About its Purpose**. Master's thesis, MIT, 2010.

D. Smith and K.C. Arnold. **Learning hierarchical plans by reading simple English narratives**. *Commonsense Workshop at the ACM International Conference on Intelligent User Interfaces (IUI)*, 2009.

Indicates *undergraduate student researcher.

Talks and Other Publications

"Does Data + Math = AI?" talk at Calvin Mathematics/Statistics Colloquium, February 2024

"Exploring Generative AI with Prompt Engineering." workshop for student group (Google Developer Student Club), December 2023

"Redeeming the Parrots: Using Language Models Responsibly." Annual meeting of American Scientific Affiliation (professional society of Christians in science), Toronto CA, July 2023. Three student researchers contributed to the presentation and presented more details at a pre-conference workshop.

Organized and led a one-day faculty development workshop on generative AI, May 2023

Panelist at Calvin Philosophy Club roundtable discussion on AI, February 2023

"ChatGPT is not Magic" talk at a Grand Rapids-area professional meetup ("Big Data Ignite"), January 2023

"AI and Writing: Laziness or Thoughtfulness?" talk at Association of Christians in the Mathematical Sciences (ACMS) conference, June 2022

Ceballos-Zapata, Abraham, Arnold, K.C., and *McCallion, Emma, "Future Visions in Language Pedagogy", talk at Calvin World Languages Forum, Spring 2021

Kenneth C. Arnold. *Faithful Text Prediction*. Christian Courier, September 13, 2021.

J. Nathan Matias, Lydia Manikonda, Scott Hale, Kenneth C. Arnold. *Artificial Intelligence in Christian Thought and Practice*. https://medium.com/ai-and-christianity/artificial-intelligence-in-christian-thought-and-practice-20ec8635a94f. 2017

Patents

From my internship at Microsoft Research:
Interactive context-based text completions. Kenneth C. Arnold, Kai-Wei Chang, Adam Tauman Kalai. (US20180101599A1, pending).

From my internship at IBM (all list inventors as: Jacob C. Albertson, Kenneth C. Arnold, Steven D. Goldman, Michael A. Paolini, Anthony J. Sessa):
Controlling resource access based on user gesturing in a 3D captured image stream of the user. (US7971156 issued Jun, 28 2011).
Informing a user of gestures made by others out of the user's line of sight. (US7725547 issued May, 25 2010).
Tracking a range of body movement based on 3D captured image streams of a user. (US7840031 issued Nov, 23 2010).
Warning a vehicle operator of unsafe operation behavior based on a 3D captured image stream. (US7792328 issued Sep, 7 2010).
Controlling a document based on user behavioral signals detected from a 3D captured image stream. (US7877706 issued Jan 25, 2011).
Controlling a system based on user behavioral signals detected from a 3D captured image stream. (US7801332 issued Sep, 21 2010).
Warning a user about adverse behaviors of others within an environment based on a 3D captured image stream. (US8269834 issued Sep 18, 2012).
Adjusting a consumer experience based on a 3D captured image stream of a consumer response. (US8295542 issued Oct 23, 2012).

Teaching

Calvin University Aug 2019–present
Assistant Professor

- CS 108 *Introduction to Computing*
- CS 106 *Introduction to Scientific Computing and Modeling*
- DATA 202 *Data Wrangling and Predictive Analytics*
- DATA 303 *Applied Modeling and Visualization*
- CS 344 *Artificial Intelligence and Machine Learning* (now repackaged as CS 375 + 376)
- INFO 602 *Predictive Analytics*
- informal "bootcamp" on deep learning and web development technology
- Senior Project mentoring
- Assisted in developing online Masters in Data Science program

CS 109A: Introduction to Data Science, Harvard University
Teaching Fellow (with Pavlos Protopapas and Kevin Rader) Fall 2018

CS 282r: Decision-Making Under Uncertainty, Harvard University
Teaching Fellow (with Prof. Finale Doshi-Velez) Spring 2015

CS 179: Design of Usable Interactive Systems, Harvard University
Teaching Fellow (with Prof. Krzysztof Z. Gajos) Spring 2013

CS 314: Computer Organization, Cornell University
Head Consultant (with Prof. Sally A. McKee) Spring 2006

Johns Hopkins Center for Talented Youth, St. Mary's City, MD USA
Computer Science Teaching Assistant Summer 2005

Work Experience

Calvin University, Grand Rapids, MI
Assistant Professor Aug 2019–present

Microsoft Research New England, Cambridge, MA USA
Research Internship Fall 2015

Luminoso, Cambridge, MA USA
Co-founder, Researcher, Developer 2011 and Summer 2013

MIT Media Lab, Cambridge, MA USA
Research Assistant August 2007–August 2011

IBM, Austin, TX USA
Extreme Blue Intern Summer 2006

NASA Goddard Space Flight Center, Greenbelt, MD USA
Nonlinear Signal Analysis Research Programmer Summer 2003 and 2004

Mentoring

- Undergraduate Summer Researchers: 2020 (2 students), 2022 (4 students), 2023 (7 students)
- Computer Science Senior Projects: 2023–24 (2 students), 2022–23 (2 students on 1 project), 2021–22 (7 students on 2 projects), 2020–21: (2 students on 1 project), 2019–20 (1 student)
- Academic advising: 30–40 students per year

Reviewing

ACM SIGCSE TS (2023), ACM CSCW (2022), Workshop on Intelligent and Interactive Writing Assistants (2022, 2023), Transactions on Computer-Human Interaction (ACM ToCHI) (2021), NSF Panelist (2021), ACM CHI (2012, 2017, 2018, 2019, 2020, 2021), IUI (2012, 2014), UIST (2020), IEEE Intelligent Systems (2012), Journal of Statistics Education (JSE) (2020). International Journal of Christian Education (IJCE) (2023). Awarded "Special recognition" for CHI 2017 reviewing.

Miscellaneous

- New City Fellowship (Grand Rapids): sound reinforcement, livestream video production, piano accompaniment, singing in choir, facilities logistics (2020–present)

- Citylife Presbyterian Church (Boston): sound reinforcement, video production, operations and logistics, diaconal service (2011–2019)
- Indigitous Global Hackathon for Christian Missions, Boston site (2016): organizer
- **Student group leadership**: Harvard Aikido club, MIT Graduate Christian Fellowship, MIT Cross Products (a cappella group)
- Teaching with MIT's Educational Studies Program (2007, 2010).
- Teaching with Clubes de Ciencia Ensenada, Summer 2016: Deep Learning and Remote Sensing
- **Student Volunteer**: CHI 2014