

Kenneth C. Arnold

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Research Interests

Vision: AI should help people work better with other people.

I design and study interactive AI for *thoughtful written communication* and for *teaching and learning*.

Education

Harvard University

Ph.D., Computer Science

Research: Impacts of Predictive Text on Writing Content

Advisor: Krzysztof Z. Gajos, Intelligent Interactive Systems group

Cambridge, MA USA

May 2020

Massachusetts Institute of Technology

S.M., Media Arts and Sciences (MIT Media Lab)

Research: natural-language code search, commonsense reasoning

Advisor: Henry Lieberman, Software Agents Group, MIT Media Lab

Cambridge, MA USA

February 2010

Cornell University

B.S., Electrical and Computer Engineering, magna cum laude

Ithaca, NY USA

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.** Proceedings of the 25th International Conference on Intelligent User Interfaces (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 K.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
- “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 and Christian faith, 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

Assistant Professor

Grand Rapids, MI

Aug 2019–present

Courses taught:

- 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 375 *Artificial Intelligence* and CS 376 *Machine Learning* (formerly CS 344)
- CS 300 *Human-Computer Interaction*
- INFO 602 *Predictive Analytics*
- DATA 501 *Data Wrangling*
- 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

Teaching Fellow (with Pavlos Protopapas and Kevin Rader)

Harvard University

Fall 2018

CS 282r: Decision-Making Under Uncertainty

Teaching Fellow (with Prof. Finale Doshi-Velez)

Harvard University

Spring 2015

CS 179: Design of Usable Interactive Systems

Teaching Fellow (with Prof. Krzysztof Z. Gajos)

Harvard University

Spring 2013

CS 314: Computer Organization

Head Consultant (with Prof. Sally A. McKee)

Cornell University

Spring 2006

Johns Hopkins Center for Talented Youth

Computer Science Teaching Assistant

St. Mary's City, MD USA

Summer 2005

Work Experience

Calvin University

Assistant Professor

Grand Rapids, MI

Aug 2019–present

Microsoft Research New England

Research Internship

Cambridge, MA USA

Fall 2015

Luminoso

Co-founder, Researcher, Developer

Cambridge, MA USA

2011 and Summer 2013

MIT Media Lab

Research Assistant

Cambridge, MA USA

August 2007–August 2011

IBM

Extreme Blue Intern

Austin, TX USA

Summer 2006

NASA Goddard Space Flight Center

Nonlinear Signal Analysis Research Programmer

Greenbelt, MD USA

Summer 2003 and 2004

Mentoring

- Undergraduate Summer Researchers: 2020 (2 students), 2022 (4 students), 2023 (7 students), 2024 (4 students)

- Computer Science Senior Projects: 2024–25 (4 students across 3 projects), 2023–24 (2 students), 2022–23 (2 students), 2021–22 (7 students split into 2 projects), 2020–21: (2 students), 2019–20 (1 student)
- Academic advising: 30–40 students per year

Reviewing

- Technology, Mind, and Behavior (2024)
- Transactions on Intelligent Interactive Systems (2024)
- Nature Human Behaviour (2024)
- ACM Technical Symposium on Computer Science Education (SIGCSE TS) (2023)
- ACM SIGCHI Conference on Computer-Supported Cooperative Work & Social Computing (CSCW) (2022)
- Workshop on Intelligent and Interactive Writing Assistants (2022, 2023)
- Transactions on Computer-Human Interaction (ACM ToCHI) (2021)
- NSF Improving Undergraduate STEM Education (IUSE) Panelist (2021)
- ACM CHI conference on Human Factors in Computing Systems (2012, 2017, 2018, 2019, 2020, 2021, 2025)
- ACM Conference on Intelligent User Interfaces (2012, 2014, 2025) (Awarded “Special recognition” for CHI 2017 reviewing.)
- ACM Symposium on User Interface Software and Technology (UIST) (2020)
- IEEE Intelligent Systems (2012)
- Journal of Statistics Education (JSE) (2020)
- International Journal of Christian Education (IJCE) (2023).

Memberships

- Association for Computing Machinery
 - ACM SIGCSE Special Interest Group for Computer Science Education
 - ACM SIGCHI Special Interest Group on Computer-Human Interaction
- [American Scientific Affiliation](#) (professional society of Christians in science)

Miscellaneous

- **Languages:** Spanish (intermediate), Haitian Creole (beginner), Arabic (beginner)
- New City Fellowship church (Grand Rapids): lead of tech team (sound reinforcement, livestream video production), piano, singing in choir (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