Stanford

Jason Alan Fries

Assistant Professor of Biomedical Data Science and of Medicine (BMIR)

Department of Biomedical Data Science

NIH Biosketch available Online Curriculum Vitae available Online

Bio

BIO

Jason Fries' research focuses on training and evaluating foundation models for healthcare, positioned at the intersection of computer science, medical informatics, and hospital systems. His work explores the use of electronic health record (EHR) data to contextualize human health, leveraging longitudinal patient information to inform model development and evaluation. His research has been published in venues such as NeurIPS, ICLR, AAAI, Nature Communications, Nature Medicine and npj Digital Medicine.

ACADEMIC APPOINTMENTS

- Assistant Professor, Department of Biomedical Data Science
- Assistant Professor, Computational Medicine

PROFESSIONAL EDUCATION

- Postdoctoral Fellowship, Stanford University , Computer Science (2017)
- PhD, University of Iowa , Computer Science (2015)
- B.A., University of Iowa , Computer Science (2009)
- B.A., University of Iowa , English (2009)

SERVICE, VOLUNTEER, AND COMMUNITY WORK

- Co-organizer for Machine Learning for Health Workshop @ NeurIPS (12/2016 - 12/2018)
- Area Chair @ Machine Learning for Healthcare Conference (MLHC) (2019 - 2021)

LINKS

- Personal Website: https://web.stanford.edu/~jfries/

Research & Scholarship

PROJECTS

- Multimodal Foundation Models for Healthcare: AI-Accelerated Tumor Boards - Stanford University (1/1/2018 - present)
- IMPACT AI - Weill Cancer Hub West - Stanford University (9/1/2025 - present)

Teaching

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Yixing Jiang, Eduardo Lozano Garcia

Master's Program Advisor

Reshma Mehta, Krishna Sharma

Publications

PUBLICATIONS

- **MEDALIGN: A Clinician-Generated Dataset for Instruction Following with Electronic Medical Records**
  Fleming, S. L., Lozano, A., Haberkorn, W. J., Jindal, J. A., Reis, E., Thapa, R., Blankemeier, L., Genkins, J. Z., Steinberg, E., Nayak, A., Patel, B., Chiang, C., Callahan, et al
  edited by Wooldridge, M., Dy, J., Natarajan, S.
  ASSOC ADVANCEMENT ARTIFICIAL INTELLIGENCE.2024: 22021-22030

- **Ontology-driven weak supervision for clinical entity classification in electronic health records.** *Nature communications*
  Fries, J. A., Steinberg, E., Khattar, S., Fleming, S. L., Posada, J., Callahan, A., Shah, N. H.
  2021; 12 (1): 2017

- **Weakly supervised classification of rare aortic valve malformations using unlabeled cardiac MRI sequences** *Nature Communications*
  Fries, J. A., Varma, P., Chen, V. S., Xiao, K., Tejeda, H., Saha, P., Dunnmon, J., Chubb, H., Maskatia, S., Fiterau, M., Delp, S., Ashley, E., Ré, et al
  2019; 10

- **Snorkel: Rapid Training Data Creation with Weak Supervision** *PROCEEDINGS OF THE VLDB ENDOWMENT*
  Ratner, A., Bach, S. H., Ehrenberg, H., Fries, J., Wu, S., Re, C.
  2017; 11 (3): 269–82

- **Systematic review of foundation models for structured electronic health records.** *Journal of the American Medical Informatics Association : JAMIA*
  Guo, L. L., Arciniegas, S. E., Yan, A. P., Fries, J., Tomlinson, G. A., Sung, L.
  2026

- **Merlin: a computed tomography vision-language foundation model and dataset.** *Nature*
  Blankemeier, L., Kumar, A., Cohen, J. P., Liu, J., Liu, L., Van Veen, D., Gardezi, S. J., Yu, H., Paschali, M., Chen, Z., Delbrouck, J. B., Reis, E., Holland, et al
  2026

- **Holistic evaluation of large language models for medical tasks with MedHELM.** *Nature medicine*
  Bedi, S., Cui, H., Fuentes, M., Unell, A., Wornow, M., Banda, J. M., Kotecha, N., Keyes, T., Mai, Y., Oez, M., Qiu, H., Jain, S., Schettini, et al
  2026

- **How to interpret 'zero-shot' results from generative EHR models.** *Nature medicine*
  Bedi, S., Fries, J. A., Shah, N. H.
  2026

- **TIMER: temporal instruction modeling and evaluation for longitudinal clinical records.** *NPJ digital medicine*
  Cui, H., Unell, A., Chen, B., Fries, J. A., Alsentzer, E., Koyejo, S., Shah, N. H.
  2025; 8 (1): 577

- **Time-to-Event Pretraining for 3D Medical Imaging.** *... International Conference on Learning Representations*
  Huo, Z., Fries, J. A., Lozano, A., Valanarasu, J. M., Steinberg, E., Blankemeier, L., Chaudhari, A. S., Langlotz, C., Shah, N. H.
  2025; 2025: 100815-100851

- **Time-to-Event Pretraining for 3D Medical Imaging.** *... International Conference on Learning Representations*
  Huo, Z., Fries, J. A., Lozano, A., Valanarasu, J. M., Steinberg, E., Blankemeier, L., Chaudhari, A. S., Langlotz, C., Shah, N. H.
  2025; 2025: 100815-100851

- **Red teaming ChatGPT in medicine to yield real-world insights on model behavior.** *NPJ digital medicine*
  Chang, C. T., Farah, H., Gui, H., Rezaei, S. J., Bou-Khalil, C., Park, Y. J., Swaminathan, A., Omiye, J. A., Kolluri, A., Chaurasia, A., Lozano, A., Heiman, A., Jia, et al

2025; 8 (1): 149

- **FactEHR: A Dataset for Evaluating Factuality in Clinical Notes Using LLMs**
  Munnangi, M., Swaminathan, A., Fries, J., Jindal, J., Narayanan, S., Lopez, I., Tu, L., Chung, P., Omiye, J. A., Kashyap, M., Shah, N.
  edited by Agrawal, M., Deshpande, K., Engelhard, M., Joshi, S., Tang, S., Urteaga
  JMLR-JOURNAL MACHINE LEARNING RESEARCH.2025
- **Hospitalization prediction from the emergency department using computer vision AI with short patient video clips.** *NPJ digital medicine*
  Ip, W., Xenochristou, M., Sui, E., Ruan, E., Ribeira, R., Dash, D., Srinivasan, M., Artandi, M., Omiye, J. A., Scoulios, N., Hofmann, H. L., Mottaghi, A., Weng, et al
  2024; 7 (1): 371
- **Testing and Evaluation of Health Care Applications of Large Language Models: A Systematic Review.** *JAMA*
  Bedi, S., Liu, Y., Orr-Ewing, L., Dash, D., Koyejo, S., Callahan, A., Fries, J. A., Wornow, M., Swaminathan, A., Lehmann, L. S., Hong, H. J., Kashyap, M., Chaurasia, et al
  2024
- **Merlin: A Vision Language Foundation Model for 3D Computed Tomography.** *Research square*
  Blankemeier, L., Cohen, J. P., Kumar, A., Veen, D. V., Gardezi, S., Paschali, M., Chen, Z., Delbrouck, J. B., Reis, E., Truyts, C., Bluethgen, C., Jensen, M., Ostmeier, et al
  2024
- **A multi-center study on the adaptability of a shared foundation model for electronic health records.** *NPJ digital medicine*
  Guo, L. L., Fries, J., Steinberg, E., Fleming, S. L., Morse, K., Aftandilian, C., Posada, J., Shah, N., Sung, L.
  2024; 7 (1): 171
- **Exploring the Potential of Large Language Models in Neurology, Using Neurologic Localization as an Example.** *Neurology. Clinical practice*
  Chiang, C., Fries, J. A.
  2024; 14 (3): e200311
- **Scalable Approach to Consumer Wearable Postmarket Surveillance: Development and Validation Study.** *JMIR medical informatics*
  Yoo, R. M., Viggiano, B. T., Pundi, K. N., Fries, J. A., Zahedivash, A., Podchiyska, T., Din, N., Shah, N. H.
  2024; 12: e51171
- **MedAlign: A Clinician-Generated Dataset for Instruction Following with Electronic Medical Records.** *Proceedings of the ... AAAI Conference on Artificial Intelligence. AAAI Conference on Artificial Intelligence*
  Fleming, S. L., Lozano, A., Haberkorn, W. J., Jindal, J. A., Reis, E., Thapa, R., Blankemeier, L., Genkins, J. Z., Steinberg, E., Nayak, A., Patel, B., Chiang, C. C., Callahan, et al
  2024; 38 (20): 22021-22030
- **Characterizing the limitations of using diagnosis codes in the context of machine learning for healthcare.** *BMC medical informatics and decision making*
  Guo, L. L., Morse, K. E., Aftandilian, C., Steinberg, E., Fries, J., Posada, J., Fleming, S. L., Lemmon, J., Jessa, K., Shah, N., Sung, L.
  2024; 24 (1): 51
- **The Stanford Medicine data science ecosystem for clinical and translational research.** *JAMIA open*
  Callahan, A., Ashley, E., Datta, S., Desai, P., Ferris, T. A., Fries, J. A., Halaas, M., Langlotz, C. P., Mackey, S., Posada, J. D., Pfeffer, M. A., Shah, N. H.
  2023; 6 (3): ooad054
- **Self-supervised machine learning using adult inpatient data produces effective models for pediatric clinical prediction tasks.** *Journal of the American Medical Informatics Association : JAMIA*
  Lemmon, J., Guo, L. L., Steinberg, E., Morse, K. E., Fleming, S. L., Aftandilian, C., Pfohl, S. R., Posada, J. D., Shah, N., Fries, J., Sung, L.
  2023
- **The shaky foundations of large language models and foundation models for electronic health records.** *NPJ digital medicine*
  Wornow, M., Xu, Y., Thapa, R., Patel, B., Steinberg, E., Fleming, S., Pfeffer, M. A., Fries, J., Shah, N. H.
  2023; 6 (1): 135
- **EHR foundation models improve robustness in the presence of temporal distribution shift.** *Scientific reports*
  Guo, L. L., Steinberg, E., Fleming, S. L., Posada, J., Lemmon, J., Pfohl, S. R., Shah, N., Fries, J., Sung, L.

2023; 13 (1): 3767

- **Evaluation of Feature Selection Methods for Preserving Machine Learning Performance in the Presence of Temporal Dataset Shift in Clinical Medicine.** *Methods of information in medicine*
  Lemmon, J., Guo, L. L., Posada, J., Pfohl, S. R., Fries, J., Fleming, S. L., Aftandilian, C., Shah, N., Sung, L.
  2023

- **Efficient Diagnosis Assignment Using Unstructured Clinical Notes**
  Blankemeier, L., Fries, J., Tinn, R., Preston, S., Shah, N., Chaudhari, A.
  edited by Boyd-Graber, J., Okazaki, N., Rogers, A.
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2023: 485-494

- **INSPECT: A Multimodal Dataset for Pulmonary Embolism Diagnosis and Prognosis**
  Huang, S., Huo, Z., Steinberg, E., Chiang, C., Lungren, M. P., Langlotz, C. P., Yeung, S., Shah, N. H., Fries, J. A.
  edited by Oh, A., Neumann, T., Globerson, A., Saenko, K., Hardt, M., Levine, S.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2023

- **EHRSHOT: An EHR Benchmark for Few-Shot Evaluation of Foundation Models**
  Wornow, M., Thapa, R., Steinberg, E., Fries, J. A., Shah, N. H.
  edited by Oh, A., Neumann, T., Globerson, A., Saenko, K., Hardt, M., Levine, S.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2023

- **Investigating real-world consequences of biases in commonly used clinical calculators.** *The American journal of managed care*
  Yoo, R. M., Dash, D., Lu, J. H., Genkins, J. Z., Rabbani, N., Fries, J. A., Shah, N. H.
  2023; 29 (1): e1-e7

- **A computational approach to measure the linguistic characteristics of psychotherapy timing, responsiveness, and consistency.** *Npj mental health research*
  Miner, A. S., Fleming, S. L., Haque, A., Fries, J. A., Althoff, T., Wilfley, D. E., Agras, W. S., Milstein, A., Hancock, J., Asch, S. M., Stirman, S. W., Arnow, B. A., Shah, et al
  2022; 1 (1): 19

- **Perspective Toward Machine Learning Implementation in Pediatric Medicine: Mixed Methods Study.** *JMIR medical informatics*
  Alexander, N., Aftandilian, C., Guo, L. L., Plenert, E., Posada, J., Fries, J., Fleming, S., Johnson, A., Shah, N., Sung, L.
  2022; 10 (11): e40039

- **Evaluation of domain generalization and adaptation on improving model robustness to temporal dataset shift in clinical medicine.** *Scientific reports*
  Guo, L. L., Pfohl, S. R., Fries, J., Johnson, A. E., Posada, J., Aftandilian, C., Shah, N., Sung, L.
  2022; 12 (1): 2726

- **Dataset Debt in Biomedical Language Modeling**
  Fries, J., Seelam, N., Altay, G., Weber, L., Kang, M., Datta, D., Su, R., Garda, S., Wang, B., Ott, S., Samwald, M., Kusa, W., Assoc Computat Linguist
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2022: 137-145

- **PromptSource: An Integrated Development Environment and Repository for Natural Language Prompts**
  Bach, S. H., Sanh, V., Yong, Z., Webson, A., Raffel, C., Nayak, N., Sharma, A., Kim, T., Bari, M., Fevry, T., Alyafeai, Z., Dey, M., Santilli, et al
  ASSOC COMPUTATIONAL LINGUISTICS-ACL.2022: 93-104

- **Systematic Review of Approaches to Preserve Machine Learning Performance in the Presence of Temporal Dataset Shift in Clinical Medicine.** *Applied clinical informatics*
  Guo, L. L., Pfohl, S. R., Fries, J., Posada, J., Fleming, S. L., Aftandilian, C., Shah, N., Sung, L.
  2021; 12 (4): 808-815

- **Assessment of Extractability and Accuracy of Electronic Health Record Data for Joint Implant Registries.** *JAMA network open*
  Giori, N. J., Radin, J., Callahan, A., Fries, J. A., Halilaj, E., Re, C., Delp, S. L., Shah, N. H., Harris, A. H.
  2021; 4 (3): e211728

- **Trove: Ontology-driven weak supervision for medical entity classification.** *ArXiv*
  Fries, J. A., Steinberg, E., Khattar, S., Fleming, S. L., Posada, J., Callahan, A., Shah, N. H.

2020

- **Estimating the efficacy of symptom-based screening for COVID-19.** *NPJ digital medicine*
  Callahan, A., Steinberg, E., Fries, J. A., Gombar, S., Patel, B., Corbin, C. K., Shah, N. H.
  2020; 3 (1): 95

- **Measure what matters: Counts of hospitalized patients are a better metric for health system capacity planning for a reopening.** *Journal of the American Medical Informatics Association : JAMIA*
  Kashyap, S., Gombar, S., Yadlowsky, S., Callahan, A., Fries, J., Pinsky, B. A., Shah, N. H.
  2020

- **Assessing the accuracy of automatic speech recognition for psychotherapy.** *NPJ digital medicine*
  Miner, A. S., Haque, A., Fries, J. A., Fleming, S. L., Wilfley, D. E., Terence Wilson, G., Milstein, A., Jurafsky, D., Arnow, B. A., Stewart Agras, W., Fei-Fei, L., Shah, N. H.
  2020; 3: 82

- **Assessing the accuracy of automatic speech recognition for psychotherapy** *NPJ DIGITAL MEDICINE*
  Miner, A. S., Haque, A., Fries, J. A., Fleming, S. L., Wilfley, D. E., Wilson, G., Milstein, A., Jurafsky, D., Arnow, B. A., Agras, W., Li Fei-Fei, Shah, N. H.
  2020; 3 (1)

- **Language models are an effective representation learning technique for electronic health record data.** *Journal of biomedical informatics*
  Steinberg, E. n., Jung, K. n., Fries, J. A., Corbin, C. K., Pfohl, S. R., Shah, N. H.
  2020: 103637

- **Assessing the accuracy of automatic speech recognition for psychotherapy.** *NPJ digital medicine*
  Miner, A. S., Haque, A. n., Fries, J. A., Fleming, S. L., Wilfley, D. E., Terence Wilson, G. n., Milstein, A. n., Jurafsky, D. n., Arnow, B. A., Stewart Agras, W. n., Fei-Fei, L. n., Shah, N. H.
  2020; 3 (1): 82

- **Snorkel: rapid training data creation with weak supervision.** *The VLDB journal : very large data bases : a publication of the VLDB Endowment*
  Ratner, A., Bach, S. H., Ehrenberg, H., Fries, J., Wu, S., Re, C.
  2020; 29 (2): 709–30

- **The accuracy vs. coverage trade-off in patient-facing diagnosis models.** *AMIA Joint Summits on Translational Science proceedings. AMIA Joint Summits on Translational Science*
  Kannan, A., Fries, J. A., Kramer, E., Chen, J. J., Shah, N., Amatriain, X.
  2020; 2020: 298–307

- **Cardiac Imaging of Aortic Valve Area from 34,287 UK Biobank Participants Reveal Novel Genetic Associations and Shared Genetic Comorbidity with Multiple Disease Phenotypes.** *Circulation. Genomic and precision medicine*
  Córdova-Palomera, A. n., Tcheandjieu, C. n., Fries, J. n., Varma, P. n., Chen, V. S., Fiterau, M. n., Xiao, K. n., Tejeda, H. n., Keavney, B. n., Cordell, H. J., Tanigawa, Y. n., Venkataraman, G. n., Rivas, et al
  2020

- **Estimating the efficacy of symptom-based screening for COVID-19.** *NPJ digital medicine*
  Callahan, A., Steinberg, E., Fries, J. A., Gombar, S., Patel, B., Corbin, C. K., Shah, N. H.
  2020; 3: 95

- **Medical device surveillance with electronic health records.** *NPJ digital medicine*
  Callahan, A. n., Fries, J. A., Ré, C. n., Huddleston, J. I., Giori, N. J., Delp, S. n., Shah, N. H.
  2019; 2: 94

- **Multi-Resolution Weak Supervision for Sequential Data**
  Sala, F., Varma, P., Fries, J., Fu, D. Y., Sagawa, S., Khattar, S., Ramamoorthy, A., Xiao, K., Fatahalian, K., Priest, J., Re, C.
  edited by Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
  NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019

- **ShortFuse: Biomedical Time Series Representations in the Presence of Structured Information.** *Proceedings of machine learning research*
  Fiterau, M. n., Bhooshan, S. n., Fries, J. n., Bournhonesque, C. n., Hicks, J. n., Halilaj, E. n., Ré, C. n., Delp, S. n.
  2017; 68: 59–74

- **Brundlefly at SemEval-2016 Task 12: Recurrent Neural Networks vs. Joint Inference for Clinical Temporal Information Extraction** *Jason Alan Fries*
  Fries, J. A.
  2016: 1274–79