

JACOB KAHN

PERSONAL INFORMATION

Email jacobkahn1@gmail.com
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Scholar bit.ly/2RN27bv

RESEARCH INTERESTS

Machine learning, sequence learning, structured prediction, information retrieval, efficient learning, distributed computation, machine learning systems.

EXPERIENCE

2018 - present Research Engineer, FACEBOOK AI RESEARCH (FAIR), MENLO PARK.
I work broadly on sequence learning (speech, language, retrieval) and efficiency. I build and tech lead a team of people working on **Flashlight**, a minimalist machine learning library in C++ built for computational research in ML, which emerged from **wav2letter**, a research framework for ASR.

2016 - 2018 Engineering Intern, FACEBOOK, MENLO PARK.
Built systems and algorithms for high-performance stream processing and efficient measurement systems for product experimentation.

EDUCATION

2016 - 2018 M.S.E. IN COMPUTER AND INFORMATION SCIENCE, University of Pennsylvania.

2014 - 2018 JEROME FISHER PROGRAM IN MANAGEMENT AND TECHNOLOGY
University of Pennsylvania

 B.S.E. IN COMPUTER AND INFORMATION SCIENCE, Penn Engineering
 THESIS: *Computer Vision & Multiplayer Anchoring in Real-Time AR systems*

 B.S. IN ECONOMICS with concentrations in OPERATIONS RESEARCH and
 MANAGEMENT, The Wharton School

SELECTED PUBLICATIONS

2022 Flashlight: Enabling Innovation in Tools for Machine Learning
J. Kahn, V. PRATAP, T. LIKHOMANENKO, Q. XU, A. HANNUN, J. CAI, P. TOMASELLO, A. LEE, E. GRAVE, G. AVIDOV, B. STEINER, V. LIPTCHINSKY, G. SYNNAEVE, R. COLLOBERT
International Conference on Machine Learning (ICML) (Spotlight oral), Baltimore, Maryland, 2022

2021 Reasoning over Public and Private Data in Retrieval-Based Systems
Simran ARORA, Patrick LEWIS, Angela FAN, **Jacob Kahn***, Christopher RE*
Preprint; in submission.
* = Equal contribution.

 slimIPL: Language-Model-Free Iterative Pseudo-Labeling
Tatiana LIKHOMANENKO*, Qiantong XU*, **Jacob Kahn**, Gabriel SYNNAEVE, Ronan COLLOBERT
Proceedings of Interspeech, Brno, Czech Republic, 2021
* = Equal contribution.

- 2020 Self-Training for End-to-End Speech Recognition
Jacob Kahn, Ann LEE, Awni HANNUN
Proc. of the 45th IEEE International Conference in Acoustic, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2020.
- Libri-Light: A Benchmark for ASR with Limited or No Supervision
J. Kahn*, M. RIVIÈRE*, W. ZHENG*, E. KHARITONOV*, Q. XU*, P.E. MAZARÉ*, J. KARADAYI*, V. LIPTCHINSKY, R. COLLOBERT, C. FUEGEN, T. LIKHOMANENKO, G. SYNNAEVE, A. JOULIN, A. MOHAMED, E. DUPOUX
Proc. of the 45th IEEE International Conference in Acoustic, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2020.
 * = Equal contribution.
- Scaling Up Online Speech Recognition Using ConvNets
 V. PRATAP, Q. XU, **J. Kahn**, G. AVIDOV, T. LIKHOMANENKO, A. HANNUN, V. LIPTCHINSKY, G. SYNNAEVE, R. COLLOBERT
Proceedings of Interspeech, Shanghai, China, 2020
- Iterative Pseudo-Labeling for Speech Recognition
 Q. XU, T. LIKHOMANENKO, **J. Kahn**, A. HANNUN, G. SYNNAEVE, R. COLLOBERT
Proceedings of Interspeech, Shanghai, China, 2020
- End-to-End ASR: from Supervised to Semi-Supervised Learning with Modern Architectures
 G. SYNNAEVE*, Q. XU*, **J. Kahn***, E. GRAVE*, T. LIKHOMANENKO*, V. PRATAP, A. SRIRAM, V. LIPTCHINSKY, R. COLLOBERT
ICML Workshop on Self-Supervision in Audio and Speech, 2020
 * = Equal contribution.
- Differentiable Weighted Finite-State Transducers
 Awni HANNUN, Vineel PRATAP, **Jacob Kahn**, Wei-Ning Hsu
arXiv:2010.01003
- 2019 wav2letter++: A Fast Open-source Speech Recognition System
 Vineel PRATAP, Awni HANNUN, Qiantong XU, Jeff CAI, **Jacob Kahn**, Gabrielle SYNNAEVE, Vitaliy LIPTCHINSKY, Ronan COLLOBERT
The 44th IEEE International Conference in Acoustic, Speech and Signal Processing (ICASSP), Brighton, UK, 2019.

TEACHING AND SERVICE

University of Pennsylvania

- ALGORITHMS · CIS 320 · HEAD TA
 Combinatorial optimization, sorting, hashing, graphs, complexity theory.
- OPERATING SYSTEMS[†] · CIS 548 · HEAD TA
 Concurrency, resource management, virtual memory, file systems, virtual machines.
- DISTRIBUTED SYSTEMS[†] · CIS 505 · TEACHING ASSISTANT
 Synchronization, communication, replication. Project-based, in C++.
- DATABASE AND INFORMATION SYSTEMS[†] · CIS 550 · TEACHING ASSISTANT
 Structured data, modeling, architecture, and distributed processing.
- INTRODUCTION TO COMPUTER ARCHITECTURE · CIS 240 · TEACHING ASSISTANT
 Hardware structures, organization, machine language, C.
- COMPUTER SYSTEMS[†] · CIS 700 · TEACHING ASSISTANT
 Experimental course in advanced topics in operating systems.
- INTRODUCTION TO COMPUTER SYSTEMS[†] · CIT 593 · TEACHING ASSISTANT
 Digital logic and circuits, von Neumann architecture, ISAs, C.

OPERATING SYSTEMS · CIS 380 · TEACHING ASSISTANT
 Introductory operating system design and implementation. Project-based, in C.

† = Graduate course.

Reviewing

Regular reviewer at ICML and NeurIPS.

INVITED TALKS

March 2020 *Scaling Deep Learning for Automatic Speech Recognition*
NVIDIA GPU TECHNOLOGY CONFERENCE, San Jose, CA

RELEVANT COURSEWORK

Penn Engineering Computational Learning Theory · Machine Learning Applications in NLP ·
Convex Optimization · Algorithmic Game Theory · Algorithms ·
Distributed Systems · Machine Learning · Data Mining · Statistical
Inference · Database and Information Systems · Applied Probability Models
· Complexity Theory · Operating Systems · Computer Architecture

*The Wharton
School* Management of Technology · Corporate Finance · Managerial Accounting ·
Product Design · Managerial Economics · Monetary Economics · Risk
Analysis · Management Science · Marketing · Business Economics

OTHER

Origin Illinois, USA

Destination The unknown!

Interests Cycling · Piano · Music theory · Political science · Physics · Cosmology