Benjamin P. Danek

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Education

Arizona State University, *2017 - 2021*
Bachelors of Science, Computer Science
GPA: 3.7/4.0,

Research Interests

I am interested in **AI algorithms, systems, and applications** to real world problems. My recent work has been in healthcare, concretely:

- **Generation:** Systems of language models, LLM reasoning, resource augmented generation.
- **Prediction:** Private, and fair predictive models on clinical, and *-omics.
- **Systems:** Federated learning, distributed ML Systems

Papers

- **Danek, B. P.**, Makarious, M. B., Dadu, A., Vitale, D., Nalls, M. A., Sun, J., & Faghri, F. (2023). Federated Learning for multi-omics: a performance evaluation in Parkinson's disease. bioRxiv. https://doi.org/10.1101/2023.10.04.560604
  (Proofing stage, Cell Patterns)

- Yang, C., Wu, Z., Jiang, P., Lin, Z., Gao, J., **Danek, B. P.**, & Sun, J. (2023). PyHealth: A Deep Learning Toolkit for Healthcare Applications. Proceedings of the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 5788–5789. https://doi.org/10.1145/3580305.3599178

Work History

Graduate Research Assistant *2023 - present*
Sunlab, University of Illinois at Urbana-Champaign

Member of research group guided by Prof. Jimeng Sun working on the following projects:

- Use **prompt engineering** and multithreaded programming to implement networks of LLMs for information retrieval in clinical trial tasks in real time.
- Utilize specialized **generative language models** to boost clinical classification model accuracy for underrepresented groups for MIMIC4 and eICU datasets.
- Facilitate domain specialized code generation using **resource augmented generation (RAG)**.
- Contribute to **open source** deep learning toolkit, PyHealth.

Machine Learning Research Scientist *2023 - present*
CARD, National Institutes of Health

Leveraging AI to understand and develop treatment for neurodegenerative diseases. Supporting the Center for Alzheimer's and Related Dimentias (CARD) advanced analytics team working on:

- Benchmark **disease classification models** trained using **federated learning on distributed datasets** against models trained centrally.
- Utilizing ***-omic**, and clinical data to generate multimodality patient representations.
- Develop prototype domain specialized **generative AI assistant** to improve cross institutional genetics research.

Software Engineer *2021 - 2023*
Errors tracking, New Relic Inc.

Full stack software on Errors Inbox (SaaS) product team, where I operate within a **300,000 line code base** implemented in Java and Typescript. As an engineer, my functions entail:

- Developing an intuitive, responsive user interface using React, and GraphQL.
- Implement **automated testing**, infrastructure **monitoring**, **continuous integration** for Java applications processing petabytes of application performance logs.
- Implement in architecture proposals, and product development planning.

Undergraduate Research Assistant *2018 - 2019*
Design Informatics Lab, Arizona State University
Engage in research to support the development of safe, and graceful autonomous vehicle control. My contributions to this work were

- Establish if it is possible to elicit behavior from **deep reinforcement learning** (RL) agents by augmenting the agent environment.
- Propose, and evaluate methods for remediating **adversarial attack** susceptibility of Deep RL agents.

Undergraduate Teaching Assistant *2019*
Arizona State University
Teaching assistant for CSE 240: Introduction to Programming Languages.

Projects

- **Contributor**, PyHealth - Open source package designed to make healthcare AI more approachable for data scientists.
- **Research Lead**, Fulton Undergraduate Research Initiative - Efficacy of adversarial examples in deep reinforcement learning models, in the context of autonomous cars.

Awards and Achievements

- Intramural Research Training Award, National Institute of Aging *May 2023*
- 3rd Coast AI for Health Bowl 2nd place, Northwestern University *April 2023*
- Fulton Undergraduate Research Initiative, ASU *2019*
- Academic Achievement Scholar, ASU *2017 - 2021*
- Golden State Award, ASU *2017 - 2021*

Arizona State University

Unofficial Transcript

Name: **Benjamin P. Danek**
Student ID: **1212906888**

Print Date: 12/07/2023
External Degrees
Monta Vista HS
High School Diploma 06/01/2017

Degrees Awarded

Degree: Bachelor of Science
Confer Date: 05/03/2021
Degree GPA: 3.65
Degree Honors: Magna Cum Laude
Plan: Computer Science
Ira A. Fulton Schools of Engineering

Beginning of Undergraduate Record

2017 Fall

Course	Description	Attempted	Earned	Grade	Points
ASU 101-MEE	The ASU Experience	1.000	1.000	A	4.000
CHM 114	General Chemistry for Engrs	4.000	4.000	A+	17.332
CSE 110	Principles of Programming	3.000	3.000	A+	12.999
FSE 100	Introduction to Engineering	2.000	2.000	A-	7.334
FSE 181	Tech, Social, & Sustain System	3.000	3.000	B	9.000
MAT 270	Calculus w/Analytic Geometry I	4.000	4.000	B+	13.332

			Attempted	Earned	Points
Term GPA:	3.76	Term Totals	17.000	17.000	63.997
Cum GPA:	3.76	Cum Totals	17.000	17.000	63.997

Academic Standing: Good Standing
Term Honor: Dean's List

2018 Spring

Course	Description	Attempted	Earned	Grade	Points
CSE 205	Object-Oriented Program & Data	3.000	3.000	A+	12.999
ENG 105	Adv First-Year Composition	3.000	3.000	A+	12.999
MAT 243	Discrete Math Structures	3.000	3.000	B-	8.001
MAT 266	Calculus for Engineers II	3.000	3.000	A	12.000
PHY 121	Univ Physics I: Mechanics	3.000	3.000	A	12.000
PHY 122	University Physics Lab I	1.000	1.000	B	3.000

			Attempted	Earned	Points
Term GPA:	3.81	Term Totals	16.000	16.000	60.999
Cum GPA:	3.79	Cum Totals	33.000	33.000	124.996

Academic Standing: Good Standing
Term Honor: Dean's List

2018 Summer

Course	Description	Attempted	Earned	Grade	Points
MAT 267	Calculus for Engineers III	3.000	3.000	B	9.000
PUP 190	Sustainable Cities	3.000	0.000	W	0.000

			Attempted	Earned	Points
Term GPA:	3.00	Term Totals	3.000	3.000	9.000
Cum GPA:	3.72	Cum Totals	36.000	36.000	133.996

2018 Fall

Course	Description	Attempted	Earned	Grade	Points
CSE 120	Digital Design Fundamentals	3.000	3.000	A	12.000
CSE 240	Intro to Programming Languages	3.000	3.000	B+	9.999
MAT 342	Linear Algebra	3.000	3.000	C+	6.999
PHY 131	Univ Physics II: Elctrc/Magnet	3.000	3.000	B+	9.999
PHY 132	University Physics Lab II	1.000	1.000	A	4.000
PUP 190	Sustainable Cities	3.000	3.000	B+	9.999

			Attempted	Earned	Points
Term GPA:	3.31	Term Totals	16.000	16.000	52.996
Cum GPA:	3.60	Cum Totals	52.000	52.000	186.992

Academic Standing: Good Standing

2019 Spring

Course	Description	Attempted	Earned	Grade	Points
CSE 230	Computer Org/Assemb Lang Prog	3.000	3.000	A	12.000
CSE 301	Computing Ethics	1.000	1.000	B+	3.333
FSE 201	Engineering Undergraduate TA	1.000	1.000	Y	0.000
FSE 494	Special Topics	1.000	1.000	A	4.000
Course Topic:	EPICS Gold: EPICS in Action				
MAT 421	Applied Computational Methods	3.000	3.000	A+	12.999
SES 494	Special Topics	3.000	3.000	A	12.000
Course Topic:	Autonomous Exploration Systems				
SOC 352	Social Change	3.000	3.000	A	12.000

			Attempted	Earned	Points
Term GPA:	4.00	Term Totals	15.000	15.000	56.332
Cum GPA:	3.69	Cum Totals	67.000	67.000	243.324

Academic Standing: Good Standing
Term Honor: Dean's List

2019 Fall

Course	Description	Attempted	Earned	Grade	Points
CSE 310	Data Structures and Algorithms	3.000	3.000	A-	11.001
CSE 360	Intro to Software Engineering	3.000	3.000	B	9.000

Arizona State University

Unofficial Transcript

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Student ID: **1212906888**

Course	Description	Attempted	Earned	Grade	Points
FSE 201	**Engineering Undergraduate TA**	1.000	1.000	Y	0.000
IEE 380	**Prob & Stats Engr Prob Solving**	3.000	3.000	A	12.000
MAE 494	**Special Topics**	3.000	3.000	A+	12.999
Course Topic:	Design Optimization				
MAT 420	**Scientific Computing**	3.000	0.000	W	0.000

			Attempted	Earned	Points
Term GPA:	3.75	Term Totals	13.000	13.000	45.000
Cum GPA:	3.70	Cum Totals	80.000	80.000	288.324

Academic Standing: Good Standing
Term Honor: Dean's List

2020 Spring

Course	Description	Attempted	Earned	Grade	Points
CSE 330	**Operating Systems**	3.000	3.000	A+	12.999
CSE 340	**Principles of Programming Lang**	3.000	3.000	B+	9.999
CSE 355	**Intro Theoretical Computer Sci**	3.000	3.000	B+	9.999
CSE 471	**Intro Artificial Intelligence**	3.000	0.000	W	0.000
HST 314	**Am Cultural History Since 1865**	3.000	3.000	B	9.000

			Attempted	Earned	Points
Term GPA:	3.50	Term Totals	12.000	12.000	41.997
Cum GPA:	3.67	Cum Totals	92.000	92.000	330.321

Academic Standing: Good Standing
Term Honor: Dean's List

2020 Summer

Course	Description	Attempted	Earned	Grade	Points
CSE 485	**Computer Sci Capstone Proj I**	3.000	3.000	A+	12.999

			Attempted	Earned	Points
Term GPA:	4.00	Term Totals	3.000	3.000	12.999
Cum GPA:	3.69	Cum Totals	95.000	95.000	343.320

2020 Fall

Course	Description	Attempted	Earned	Grade	Points
COM 124	**Media and Culture**	3.000	3.000	A	12.000
CSE 477	**Intro Computer-Aided Geom Desg**	3.000	3.000	A-	11.001
CSE 486	**Computer Sci Capstone Proj II**	3.000	3.000	B	9.000
CSE 551	**Foundations of Algorithms**	3.000	3.000	B-	8.001
SWU 349	**Stress Management Tools II**	3.000	3.000	A	12.000

			Attempted	Earned	Points
Term GPA:	3.47	Term Totals	15.000	15.000	52.002
Cum GPA:	3.66	Cum Totals	110.000	110.000	395.322

Academic Standing: Good Standing

2021 Spring

Course	Description	Attempted	Earned	Grade	Points
ASB 100	**Introduction to Global Health**	3.000	3.000	B-	8.001
CSE 408	**Multimedia Information Systems**	3.000	3.000	A	12.000
CSE 573	**Semantic Web Mining**	3.000	3.000	A+	12.999
CSE 598	**Special Topics**	3.000	3.000	B	9.000
Course Topic:	Quantum Computation				
CSE 598	**Special Topics**	3.000	3.000	A	12.000
Course Topic:	Advances in Robot Learning				

			Attempted	Earned	Points
Term GPA:	3.60	Term Totals	15.000	15.000	54.000
Cum GPA:	3.65	Cum Totals	125.000	125.000	449.322

Academic Standing: Good Standing
Term Honor: Dean's List

Print Date: 12/07/2023
External Degrees
Monta Vista HS
High School Diploma 06/01/2017

Beginning of Graduate Record

END OF TRANSCRIPT