George Mastorakos, MS

MD Candidate | Mayo Clinic—Arizona | Class of 2021

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📍 Scottsdale, AZ

💠 Medical student graduating in 2021 w/ computer programming, clinical informatics, AI (ML+DL+NLP), and healthcare digital product development experience

👨‍💻 Seeking position as clinical AI specialist to ideate, build, validate, and implement robust clinical diagnostic, predictive, and efficient models within healthcare systems

🌟 Passionate about meshing my programming and medical backgrounds to create intuitive, useful automation environments that close healthcare gaps for patients at home and clinicans on the front-lines

🌱 Special interest in biomimicry, the emulation of nature's genius, in order to solve problems of all kind sustainably

PROJECTS

Domi: Machine Learning for Patient Message Triage
Team Lead/Programmer
Kern Center for the Science of Health Care Delivery, Mayo Clinic
2017 - Present

- **Mission**: Automate the laborious processes of triaging and routing incoming patient portal messages
- Collaborated with a team of computer engineers to create a multi-model ensemble classifier (0.97 AUC) and named-entity recognizer
- Recieved competitive CoDE Grant ($50,000) from Mayo Clinic
- Led an annotation team of 15 students to generate a training corpus of 10,000+ patient portal messages
- Currently implementing solution into EHR and optimizing for Google Cloud Platform

COVID-19 Triage and Virtual Survey
Clinical Team Member
Division of Biomedical Statistics & Informatics, Mayo Clinic—Rochester
2020

- **Mission**: Apply pretrained AI models to quickly and effectively triage patient concerns related to COVID
- Gathered corpus of 2 million patient-generated messages related to COVID
- Designed COVID-specific labeling scheme (e.g. swab test results, cancellations, pandemic anxiety) to an incoming stream of patient messages

Positive Change Medical Students
Co-Founder
via The Care Collaboratory
2018 - 2020

- **Mission**: Forge design thinking spaces to engage medical students in healthcare design sprints
- Organized and hosted virtual "bonfires" for international medical personnel to come together and share pandemic-response ideas
- Established design thinking playgrounds via Mural using virtual sticky notes
- Editor of clinical story publications via Medium

Length-of-Stay Outlier (LOSO) Patient Experience Design
Consultant
University of Colorado Hospital, Denver + Haas School of Business, Berkeley
2020 - 2021

- **Mission**: Collaborate with designers, professors, and clinicians to redesign the layout, workflows, and amenities for LOSO patients
- Designed dynamic, patient-specific calendar and "Home-in-a-Box" welcome kit
- Hosted virtual design sprints and conducted 10+ user-interviews with clinical staff

Hand Digit Joint Spacer Product Development
Project Manager
Department of Plastic Surgery, Mayo Clinic—Arizona
2020 - Present

- **Mission**: Develop a novel hand digit joint spacer that eliminates the need for amputation in patients with bone infections
- Leveraged biomimicry knowledge to produce novel joint spacer designs
- Served as clinical advisor to a collaborative group of 7+ bioengineering and business students at Arizona State University
- Navigated patenting and venture processes, including provisional patent establishment to building patentable claims

EDUCATION

MD
Mayo Clinic Alix School of Medicine — Arizona
2017 - 2021

MS in Biomimicry
Arizona State University (ASU)
2020 - 2021
Design Portfolio

BS in Biochemistry
University of Illinois @ Urbana-Champaign
2012 - 2016

SKILLS

Epic EHR

UMLS, SNOMED, ICD, RXNORM, DICOM

HL7, FHIR, CDISC, openEHR

Python
↳ scikit-learn, TensorFlow, Trax, spaCy, NLTK
↳ matplotlib, seaborn, plotly
SQL
Java, D3.js
HTML, Bootstrap, LaTEX
Github

COURSEWORK

Science of Healthcare Delivery
Mayo Clinic & ASU

AI for Medicine Specialization
deeplearning.ai | Coursera

Machine Learning
Stanford University | Coursera

CERTIFICATES

Silver Level — Quality Improvement
Mayo Clinic QI Academy

AWARDS

Be the Match® on Campus   **Co-Founder, President**

University of Illinois @ Urbana-Champaign Chapter   2013 - 2016

- **Mission**: Advertise need of bone marrow donors, raise funds for transplant costs, and sign up potential donors
- Collaborated with team of 10 students to educate community members about blood cancers and the necessity of bone marrow transplants
- Created automatic registration platform, registering over 3000 students as potential marrow donors
- Led a cross-country road trip to educate other institutions about Be the Match's mission

PUBLICATIONS

Journal Articles

Mastorakos GM, Khurana A, et al. (2021) "Probing Patient Messages Enhanced by Natural Language Processing: A Top-Down Message Corpus Analysis". *Health Data Science.* Volume 2021. DOI: 10.34133/2021/1504854.

Tafti AP, Fu S, Khurana A, **Mastorakos GM**, et al. (2019) "Artificial intelligence to organize patient portal messages: a journey from an ensemble deep learning text classification to rule-based named entity recognition". *2019 IEEE Bioinformatics and Biomedicine (BIBM)*, 1380–1387. DOI: 10.1109/BIBM47256.2019.8982942.

Patel P, Ivanov D, Bhatt S, **Mastorakos GM**, et al. (2019) "Low-Cost Virtual Reality Headsets Reduce Perceived Pain in Healthy Adults: A Multicenter Randomized Crossover Trial". *Games for Health Journal*. DOI: 10.1089/g4h.2019.0052.

Godzik J, Walker CT, Hartman C, Andrada BD, Morgan CD, **Mastorakos GM**, et al. (2019) "A Quantitative Assessment of the Accuracy and Reliability of Robotically Guided Percutaneous Pedicle Screw Placement: Technique and Application Accuracy". *Operative Neurosurgery*. 17(4), 389–395. DOI: 10.1093/ons/opy413.

Erikson AK, Yu NY, DeWees TA, Daniels TB, Ashman JB, Sharma A, Porter AB, Mrugala M, Golafshar M, **Mastorakos GM**, et al. (2019) "Clinical Outcomes of Single or Multi-Fractionated, Single-Isocenter, Multi-Arc Volumetric Modulated Radiotherapy (VMAT) for Stereotactic Radiosurgery (SRS) for Palliation of Multiple Brain Metastases". *International Journal of Radiation Oncology, Biology, Physics*. 105(1, Supplement), E561–E562. DOI: 10.1016/j.ijrobp.2019.06.1313.

Pines AR, Khurana A, **Mastorakos GM**, et al. (2018) "A Prognosis for Health Systems Science Courses: Observations From Current Students". *Academic Medicine*. 93(10), 1434–1436. DOI: 10.1097/ACM.0000000000002369.

Pfaller CK, **Mastorakos GM**, Matchett WE, et al. (2015) "Measles Virus Defective Interfering RNAs Are Generated Frequently and Early in the Absence of C Protein and Can Be Destabilized by Adenosine Deaminase Acting on RNA-1-Like Hypermutations". *Journal of Virology*. 89(15), 7735–7747. DOI: 10.1128/JVI.01017-15.

Conference Presentations

"Patient Asynchronous Response to Coronavirus Disease 2019 (COVID-19): A Retrospective Analysis of Patient PortalMessages". *AMIA 2021*. San Diego, CA.

"Analysis of Patient Portal Usage among Patients and Providers from 2010-2017: A Single Institutional Cohort Study". *AMIA 2021*. San Diego, CA.

Mastorakos GM, Khurana A, Bolen E, et al. (2019) "Developing a fully annotated textual dataset to advance autonomous patient message summarization and classification". *Artificial Intelligence Symposium*. Mayo Clinic, Phoenix, AZ.

PHILOSOPHY

"Society grows great when elders plant trees in whose shadow they will never sit."

"Sometimes the questions are complicated, and the answers are simple."

"Whoever cannot seek the unforeseen sees nothing, for the known way is an impasse."

Surgical Healthcare Challenge – Second Place ($5,000)

MIT Hacking Medicine   2018

Two-day hackathon hosted by MIT and American College of Perioperative Medicine inviting medical, business, law, architecture professionals to innovate in groups of 4-5

Presented product idea Rosy as a surgical workflow optimizer and postoperative patient assistant

LANGUAGES

English   ●●●●●
Spanish   ●●●●○
Greek   ●●●●○

TITLES

🥁 Drummer
🎧 Disc Jockey
🎾 Racquet Sport Player
🎓 1st Gen College Student
🖼 Traveler