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Mai Elkady

Interests

Machine Learning, Deep Learning, Generative Models, Normalizing Flows, Big data, Computational Biology, Bioinformatics

Education

Dec 2020 - Present — **Nanodegree in Data Science**, *Udacity*, Online.

Aug 2018 – Present — **Ph.D. in Computer Science**, *Purdue University*, West Lafayette, IN, USA.
- GPA: 3.8
- Advisor: Petros Drineas, David Inouye
- Honors: The Purdue University Teaching Academy Graduate Teaching Award for Spring 2020

Aug 2016 – May 2018 — **M.Sc. in Computer Science**, *Purdue University*, West Lafayette, IN, USA.
- GPA: 3.8
- Honors: Fulbright Scholarship

Sep 2007 – June 2012 — **B.Sc. in Communication Systems**, *Ain Shams University*, Cairo, Egypt.
- GPA: 3.58
- Honors: Dean's list for Fall 2007 and Spring 2008

Skills

Programming Languages — Python, C/C++, MATLAB, R, SQL, PHP

Languages — Fluent in English and Arabic (mother tongue), Basic knowledge in German (A1)

Publications

Workshops — **Mai Elkady**, Jim Lim, David I. Inouye,"Discrete Tree Flows via Tree-Structured Permutations", ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (INNF+), July 2021

Conferences — Sabine Brunswicker, **Mai Elkady**, Feny Patel, "Submissions to a COVID-19 Data Science Challenge: the role of skills and platform engagement", ACM Collective Intelligence Conference, June 2021

Journals — A. Bose, V. Kalantzis, E. Kontopoulou, **M. Elkady**, P. Paschou, P. Drineas,"TeraPCA: A fast and scalable software package to study genetic variation in tera-scale genotypes", Bioinformatics

Experience

June 2021 – Present — **Content Developer**, *Computer Science Department*, Purdue University.
- Developed new homework content for CS 159:C Programming
- Tested and deployed the homework's code on the vocareum platform

June 2021 – July 2021 **Research Mentor**, Summer STEM Institute (SSI).
- Worked closely with three high school students to help them design and conduct their own data science research projects.
- Hosted office hours for students in the bootcamp and research program.

Nov 2020 - April 2021 **Fellow**, *Research Center for Open Digital Innovation (RCDOI)*, Purdue University.
- Worked preparing data for IronHacks COVID-19 August 2020 Hackathon.
- Worked on analyzing topics for participants notebooks, by running LDA for topic modelling.
- Analyzed participants data to gather interesting observations, and determine the important factor predicting a participant to submit.

May 2020 – Dec 2020 **Research Assistant**, *Computer Science Department*, Purdue University.
- Worked on data size reduction by selecting the most informative rows and sketching the columns for the purpose of being used later in logisitc regression.
- Wrote code in Python and MATLAB to implement and examine potential methods of solving this problem.

Aug 2018 – May 2020 **Teaching Assistant**, *Computer Science Department*, Purdue University.
for Programming in C (CS 240) - Fall 2018, Fall 2019, Spring 2020
- Held labs and office hours to assist students with coding problems
- Graded quizzes, and exams
- Developed assignments to test the student's understanding

for Foundations of Computer Science (CS 182) - Spring 2019, Spring 2021
- Held office hours to assist students with problems
- Graded Homeworks

Feb 2013 – July 2016 **Junior Lab Engineer**, *Electronics Department*, The American University in Cairo (AUC).
- Operated and maintained electronic equipment (servers, computers, printers, sophisticated measurement equipment, kits and development board) in the Electronics and Communications Engineering laboratories and offices.
- Assisted students with technical problems in labs and with courses' projects including senior projects.

Dec 2015 – Jan 2016 **System Administrator & Developer for Arches**, *Theban Mapping Project (TMP)*, AUC.
- Worked on creating a web based database of Egyptian archaeological sites using an open source software product called 'Arches' which has been particularly developed for inventories of cultural heritage.
- Customized Arches for the Egyptian database by writing code in Python, JavaScript, HTML, and CSS

Sep 2014 – Dec 2014 **Teaching Assistant for Communications Lab (ECNG 4314)**, *Electronics Department*, AUC.
- Assisted students with technical difficulties in the lab
- Graded quizzes

Projects

Aug 2020 – Sep 2020 **IronHacks COVID-19 Data Science Challenge**, *Purdue University*.
Participated and won third place in the Ironhacks COVID-19 Data Science Challenge where the task was to predict the weekly foot traffic at merchants in Indiana in order to understand the COVID-19 impact and risk. To solve this problem I used **Python** to train a ridge regression model that was able to obtain good results in predicting the foot traffic at various stores in Indiana.

Dec 2018 – Jan 2019 **Flower Species Identification**, *PyTorch Scholarship Challenge Program, Udacity*.
Employed a DenseNet pre-trained Convolutional Neural Network model to train an image classifier to identify 102 different species of flowers. The code was written in **Python** and used **PyTorch** for deep learning, and the training was done utilizing GPUs on Google Colab. The project was then deployed as a webapp using Flask on herokuapp.

May 2017 – Aug 2017 **Synthetic Genotype Data Simulator**, *Purdue University*.
As part of a team, implemented a data simulator in **C/C++** that generates synthetic genotype data using the Pritchard-Stephens-Donnelly (PSD) model.

Oct 2016 – Nov 2016 **Data Mining Project: Predicting Pulp Fiction Lovers**, *Purdue University*.
As part of a class Kaggle competition, tried several Machine learning approaches, and coded them in **R** and **Python**, to predict whether users will like the movie Pulp Fiction given their previous movie ratings.

Sep 2011 – June 2012 **Seniors Graduation Project**, *Ain Shams University*.
- Wrote **Bash scripts** to parse log files of calls in Vodafone network, and stored the output of the parsing in a **MySQL** database.
- Built a website in **PHP** that graphically represents data stored in the database.

Posters

July 2021 "Discrete Tree Flows via Tree-Structured Permutations", ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models (INNF+)

June 2019 "TeraPCA: A Fast and scalable method to study genetic variation in tera-scale genotypes", American Society of Human Genetics (ASHG), Orlando, FL, October 2017 (presented by A. Bose)/ Gene Goloub SIAM Summer School, Aussois, France, June 2019 (presented by **M.Elkady**)

Attended Conferences and Summer Schools

June 2019 **Gene Goloub SIAM Summer School (G2S3)**, *Aussois, France*.
Selected as one of the 40 participants to attend the 9th G2S3 on high performance data analytics

Sep 2018 **Grace Hopper Conference (GHC)**, *Houston, Texas*.
Awarded a scholarship by Purdue Computer Science department to attend GHC 2018

Activities

Jan 2017 – Aug 2019 **Outreach officer**, *Purdue Fulbright Association (PFA)*, West Lafayette, IN, USA.
- Organized events and activities for PFA members.

Jan 2016 – July 2016 **Volunteer**, *Safarni*, Cairo, Egypt.
- Designed decorations for safarni travel days.
- Directed and supervised kids during the safarni travel days.

May 2015 – May 2016 **Graphic designer & Social media member**, *Have A Dream*, Cairo, Egypt.
- Prepared designs and illustrations to promote Have A Dream events.
- Managed Have A Dream facebook's page and website.

Sep 2012 – Oct 2012 **Exchange Participant**, *International Kindergarten Project*, Lublin, Poland.
- Taught children aged from 4 - 12 years about Egypt and its culture.
- Prepared weekly activities plan for each day (with games, dances, songs and/or presentations) to engage the children in learning.