Ayman Boustati

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I am a second year PhD student at the University of Warwick and the Alan Turing Institute. I am working on developing transfer learning and multitask learning methodologies for Gaussian Process models with applications in medical diagnostics.

Education

Current

- **University of Warwick** — **Coventry, UK**
  PhD in Mathematics for Real-World Systems — *2016–2020*
  Thesis Topic: Multitask and Transfer Learning in Gaussian Process Models
- **Alan Turing Institute** — **London, UK**
  Enrichment Student, 2nd year of PhD — *2017–2018*

Past

- **University of Warwick** — **Coventry, UK**
  MSc in Mathematics for Real-World Systems — *2015–2016*
  Result: Distinction
- **University of Warwick** — **Coventry, UK**
  Integrated Masters in Mathematics, Operational Research, Statistics and Economics — *2011–2015*
  Result: First Class Honours
- **University of California, Berkeley** — **Berkeley, California**
  Summer Sessions — *2013*

Research Projects

Current

- **PhD Project:** *'Multitask and Transfer Learning for Gaussian Process Models'*
  For my PhD, I am working on developing multitask and transfer learning methods for Gaussian Processes with focus on applications in medical diagnostics. I am currently studying techniques for applying multitask learning in Deep Gaussian Process models. My plan is to move onto investigating full inductive transfer for these models at a later stage in my PhD.

Past

- **Turing Data Study Group (December 2017):** *'How Do Our Food Choices Affect Climate Change'*
  I was the facilitator for the team working on this project. The project was in collaboration with CodeCheck with the goal predicting the carbon footprint values of a collection of products using machine learning. My role involved managing the project, leading discussions and insuring that research output is produced.

- **Turing Data Study Group (September 2017):** *'Assessment of Severity in Accident & Emergency Patients'*

  I was part of a team working with Queen's Hospital A&E data. I was assigned the task of building a system that outputs a severity score for a patient based the nurse's description of their condition in free text. I solved the problem by implementing a character-level Convolutional Neural Network.

- **Turing Data Study Group (May 2017):** *'Synthetic Data Generation for Banking Applications'*

  I worked alongside my team on creating a Probabilistic Graphical Model for generating synthetic data resembling that of HSBC's customers.

- **Turing Data Study Group (December 2016):** *'Predicting Oil and Water Flow Through Pipelines Using Acoustic Signals'*

  I was part of a team working on the problem posed by Shell. I implemented a Multitask Gaussian Process model in GPy to solve the challenge.

- **MSc Project (Individual):** *'Identifying Illegal Trading and Market Manipulation Using Machine Learning'*

  The project was in collaboration with Spectra Analytics, a data science start-up. I worked on assessing the efficacy of machine learning algorithms to detect certain types of manipulative behaviour in a simulated market.

- **MSc Project (Group):** *'Intelligent Mobility Applications for the UK Strategic Road Network'*

  I was part of a five-person group working in collaboration with Thales UK. The aim of the project was to develop algorithms that can predict the duration of traffic jams in some areas in the UK. One of my contributions was implementing a software in Python that automatically downloads data from the Highways England servers, then cleans and stores it in a database in the cloud.

- **Integrated Masters Project:** *'Extracting Information from Facial Images Using Artificial Neural Networks'*

  I worked on comparing the performance of Fully-Connected and Convolutional Neural Networks in tasks such as age prediction, gender classification and facial keypoint detection. I also experimented with embeddings using Convolutional Auto-Encoders.

- **Summer Research Project:** *'Comparison of Video Coding Standards for High Dynamic Range Video Sequences'*

  I worked on comparing HDR compression algorithms, as well as developing a framework for encoding and decoding HDR video sequences in Matlab.

Work Experience

- **GoHDR** — **Coventry, UK**
  Part-Time Research Assistant — *October 2014 – December 2014*

  I was responsible for implementing HDR image compression algorithms in Matlab and performing experimentation.

- **Warwick Manufacturing** — **Coventry, UK**
  Research Intern — *September 2014 – June 2014*

  I worked on developing a framework for encoding and decoding HDR video sequences in Matlab.

- **Banque Bemo Saudi Fransi** — **Damascus, Syria**
  Intern — *July 2009 – August 2009*

  I did a work experience in the retail and customer service divisions in the bank.

Skills

- **Programming:** Python (incl. Scipy Stack and Tensorflow), R, Matlab, C++, Bash
- **Software:** GNU/Linux, SQL, Git, LaTeX
- **Languages:** English (Fluent), Arabic (Native), French (Beginner)

Activities and Awards

- **Alan Turing Institute**
  Data Study Group, Facilitator. *December 2017*
- **Alan Turing Institute**
  Enrichment Programme, Stipend top-up for one year. *September 2017 – September 2018*
- **Gaussian Process Summer School**
  University of Sheffield, Participant. *September 2017, September 2016*
- **Alan Turing Institute**
  Data Study Group, Participant. *September 2017, May 2017, December 2016*
- **Machine Learning Summer School**
  University of Warwick, Co-organiser. *June 2017*
- **Deep Learning Reading Group**
  University of Warwick, Organiser. *November 2016 – July 2017*
- **Warwick Anniversary Scholarship**
  University of Warwick, Award for 3.5 years of PhD funding. *October 2016 – March 2020*
- **Centre for Complexity Science Newsletter and Publicity Team**
  University of Warwick, Team member. *October 2015 – September 2017*
- **NGCM Summer Academy**
  University of Southampton, Participant. *June 2016*
- **Undergraduate Research Support Scheme**
  University of Warwick, Summer research project award. *September 2014*
- **Secretary**
  Warwick Aikido Club, Organisation and publicity roles. *October 2012 – June 2015*

Interests

- **Research:** Machine Learning, Bayesian Inference (mainly Variational Inference), Gaussian Processes, Transfer and Multitask Learning, Probabilistic Modelling, Deep Learning, Applications of Artificial Intelligence (mainly in healthcare)
- **General:** Technology, Current Affairs, Basketball, Aikido, Tennis, Travelling, Electronic Music