

Husain Al-Mohssen

Summary

I am a team leader with a proven record of building and managing software engineering, data science and ML teams. I have a track record of delivering effective results in business and academic environments. Creating products that delight users is what I live for.

Education

- *Massachusetts Institute of Technology*, PhD 2010, Master's 2003, School of Engineering with Minor in Entrepreneurship and Management
- *KFUPM - Saudi Arabia*, BS 1998, Mechanical Engineering

Recent Work History

Manager, ML Modeling, iRobot — 2018 -

I was internally recruited to develop the marquee feature of next-gen robots. My team's focus is on:

- **ML Research & Development** of robot embedded CNN models that:
 - have repeatable SOTA performance in *millions of homes*
 - are optimized for multiple tasks
- **Designing and implementing data collection processes and infrastructure** including:
 - guaranteeing user privacy
 - cost effective labeling and synthetic data generation
- **Corporate ML technology support:**
 - Collaborate with iRobot Ventures to find partners/investments
 - IP/patent production (more details below)

As the team leader I focus on:

- *product strategy* developing ML product roadmaps that meet PM, UX and cost constraints
- *Scientific leadership* help my team review and build on latest DL/ML literature.
- *Software architecture* selecting the right tools and vendors to support our data pipeline and training needs.
- *team growth* Our team grew from a couple of interns to a team of 25+. I Interviewed 100's of candidates and worked with HR to enhance our team's *diversity*.

Principle Data Scientist, iRobot — 2017-2018

- Developed data science models that distilled the data streaming from millions of robots to actionable intelligence used by everyone in the company (from executives down to rank-and-file engineers).
- Research to support cutting-edge digital robot user experiences focused on machine learning and augmented reality. Built The minimal viable products that were used to to prove out concepts and

solidify product roadmaps.

- Hire, mentor, collaborate with and managed teams to support the above three focus areas.

Lead Instructor, General Assembly & Professional Speaker at No Fluff Just Stuff Conferences — 2015-

Taught DS/ML programs and professional conference workshops that vary in length from a single day to multiple months. Topics include machine learning methods, visualization, Big Data, software architecture & other related approaches.

Data Scientist & Software Architect, EnerNOC, — 2014-2016

- Researched different methods of modeling and projecting energy data and time-series (25 provisional & issued patents).
- Managed and participated in academic collaborations with WPI, MIT and Harvard in the areas of energy and machine learning software Architecture.
- I designed and built multiple IoT time-series processing engines to for energy analytics products. These systems consumed TBs/day in a near realtime using Apache Spark and AWS Lambda.

Automation Tech Lead/Sr. Software Engineer, Vecna, — 2011-2014

- Designed & wrote base testing service using standard tools (Selenium, AWS, Docker, Jenkins).
- Hired and trained a team of 4 engineers to introduce company-wide automation.
- I was the sole maintainer and dev ops engineer for the GoalMind product. GoalMind was a 250k LOC internal Java/JavaScript web-app that managed finances, time-keeping and planning for Vecna and it's VA customers spanning 1000's of hospitals that serve millions of patients.

Tools

I have evaluated, used and taught many tools over the years, some of my favorites:

- *Machine Learning & Data Science:* TensorFlow, CoreML, Apache Spark and Kubeflow Pipelines.
- *Languages:* Wolfram, Clojure/ClojureScript, Java, Python and Scala (in that order)
- *Cloud and distributed systems:* I've been using linux since 0.96, and used it to build big and small systems on anything from hand-built HPC clusters to large scale AWS and GCP deployments. Most recently, I have been using Kubeflow Pipelines to train and validate ML models at the scale of 10's of millions of images.

Older Work Experience

Co-Founder and CTO, Syphir LLC; Boston, MA — 2008-2010

I assembled and led a team that won the 1st prize MIT Arab Business Plan Competition(\$50k), we used the prize to kickstart the company and release two products (*LabelRank* and *SmartPush*) that were used by thousands of paying customers. Elements of these products have been incorporated into Gmail

Associate Product Manager(Intern), Google Inc.; Mountain View, CA — Summer 2007

- Developed a internal product to understand and forecast global Google datacenter resource utilization
- Did research on rational pricing of cluster resources for planet-scale applications
- My 20% time project was a novel UI element that was patented and is still used by Chrome today

Research Assistant, MIT; Cambridge, MA — 2004-2010

PhD Topic: Variance Reduced Monte-Carlo Gas Simulations on Distributed Systems

- I was responsible for the design, building and administration of my group's High Performance Computing facilities, networks and software
- Led a team of 20 MIT faculty and graduate students on a visit to Saudi Aramco; the trek resulted in a multi-million dollar collaboration between Aramco and the MIT Energy Institute

Consulting Engineer, Saudi Aramco, — 2003-2004, 2010-2012

One of two engineers representing the final technical authority for the selection, maintenance and operation of the 380+ gas turbines that pump the majority of Saudi Arabia's oil

Patents

20+ provisional and granted patents in the areas of:

- Robotics
- Energy Management
- Machine Learning/DL
- User Interfaces

An up to date list is [here](#)

Journals, Conferences and Periodicals

I have a large body of well-cited academic work. A list can be found [here](#). I am particularly proud of my invited talks, papers and chapters:

1. *Applying Big Data approaches to publication social networks*, Boston, Hack/Reduce: BDM, December 14, 2014.
2. *National Science & Technology Innovation Plan: Program[X], The Flagship Projects & Innovation Networks*, Advanced Technology Forum, 2014, Riyadh, Saudi Arabia, September 16 – 18 2014.
3. Al-Mohssen, H.A., Hadjiconstantinou, N.G.; *Low-variance direct Monte Carlo simulations using importance weights*, Mathematical Modeling and Numerical Analysis, Volume 44, Number 5, September–October 2010.
4. *Variance-Reduced DSMC for Low Speed/Signal Applications*, Kyoto University, June 24, 2010.
5. *Realistic and Practical Dynamics Simulations of Molecular/Boltzmann flow in in Nano-fluidic Devices*, King Saud University, October 19, 2010.
6. *Designing and Manufacturing Practical Nano/Micro Devices Using Molecular/Boltzmann Flow Simulation Tools*, KFUPM, December 14, 2010.
7. *Retrofitting Multijack Tensioners on a combustion gas turbine generator*, Hydrocarbon Processing Magazine, Vol. 81 No. 1, January 2002.

8. *Linux and the Future*, Linux Gazette, Issue 46, October 1999.

Awards

- TAKREEM Young Entrepreneur Award finalist (2010) and TAKREEM Advisory Board Member (2011).
- SciTech MIT ASO North American Graduate Student of the Year Award (2010).
- 1st Prize of the \$50k MIT Pan-Arab World Business Plan Competition (2009).
- Many awards and scholarships from Saudi Aramco, KFUPM and Saudi Government.