

Adnan Hafeez, M.Sc

OBJECTIVE

I am a dedicated senior electrical engineering student with numerous years of experience in physics simulations, control system analysis and image processing. I also hold an advanced masters degree in Medical Physics with a focus in imaging systems. I am seeking electrical engineering research position.

EDUCATION

- 2017
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2019
- **Master of Science in Medical Physics**
2-Year CAMPEP Accredited Medical Physics Program
University of Manitoba/CancerCare Manitoba
□ Winnipeg, Manitoba
Thesis: Improved Quality Assurance Phantom for Characterization of Automatic Tube Current Modulation for Computed tomography Systems
 - **Bachelor of Engineering (Electrical)**
• Dean's Honours List: GPA: 3.91/4.00
Carleton University
□ Ottawa, Ontario
 - **Bachelors of Science, (Joint Honours in Physics and Chemistry)**
University of Manitoba
□ Winnipeg, Manitoba
Honours Thesis: Synthesis of Forskolin Analogues as selective Adenyl Cyclase Activators
 - **Diploma of Secondary Studies**
Carlton Comprehensive High School
□ Prince Albert, Saskatchewan
Achievements: Honours with Great Distinction Graduate, Skills Canada Provincial Gold Medalist in Engineering Design (2010), Skills Canada National Engineering Design - 4th place (Waterloo, 2010)
 - **Massive Online Courses (selective list)**
Introduction to Machine Learning
Machine Learning with TensorFlow
Microsoft Azure - Machine Learning Competency (2020)
Coursera - Structuring Machine Learning Projects (2020)
Coursera - Neural Networks and Deep Learning (2020)
Coursera - Improving Deep Neural Networks: Hyperparameter tuning, regularization and optimization (2020)
Coursera - Convolutional Neural Networks (2020)

KEY SKILLS

Engineering Skills

- **Physics Simulation:** MATLAB, COMSOL Multiphysics
- **Signal Processing:** Analyzed imaging systems via DPS, Infinite Impulse Response. Source coding audio compression, image compression and video compression.
- **Design:** AutoCAD Inventor, Fusion360, AutoDesk Eagle (PC board layouts)
- **Control Systems design and implementation**
- **Image Analysis:** ImageJ, custom designed image segmentation and analysis software.

Computational Skills

- **Programming:** C#, C, C++, Python (OOP), MATLAB, Java, MySQL
- **Data Science:** SciKit-Learn, NumPy, SciPy, Plot.ly, Pandas, Matplotlib, Spark, Linux, MongoDB, Apache, TensorFlow, Tableau, Seaborn, Plot.ly, OpenCV, SQL Server 2014+, SQL Scripting,
- **DevOps:** AWS, Microsoft Azure
- **Front-end:** HTML5, CSS5, Javascript, PHP, Microsoft SharePoint, Wordpress, Joomla, Drupal 8
- **Back-end:** Django
- **Wireframing:** Microsoft Powerpoint, Excel, Adobe Dreamweaver
- **Version Control:** Github, Git
- **Designing:** Illustrator, Photoshop, Fusion 360, AutoCAD, Inventor, Meshmixer, LTSpice (PCB, filters, detector arrays), Microsoft SharePoint Designer

PROFESSIONAL EXPERIENCE

CONTACT INFO

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438.504.7106

SKILLS

Programming and DevOps
Python, MATLAB, C/C#, C++
Front-End Web Development
HTML, CSS, Javascript, Java
Machine Learning
Microsoft Azure Automated
Machine Learning
Pandas, Seaborn, Tableau,
Plot.ly, Spark
Data Mining, Data Visualization,
Problem-Solving, Risk Analysis
Active Learning
Ubuntu Operating Systems
Scripting
Windows, MacOSX, Microsoft
Office
Graphic and Layouts
Adobe Photoshop, Illustrator,
Dreamweaver
Documentation: SharePoint
2010, 2013, 2019

Engineering
Fusion 360, Inventor, AutoCAD,
MeshMixer, LTSpice

Medical Physics
Diagnostic Medical Physics
Competence
Radiotherapy Medical Physics
Competence

2020
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present

Alberta Health Services - Software Engineer

Tom Baker Cancer Centre/Foothills Medical Centre

□ Calgary, Alberta

- Fully competent in Canadian radiation health standards, and regulatory body recommendations, such as CPQR, CNSC, Alberta Health Services as relating to nuclear medicine, brachytherapy, radiation oncology and diagnostic imaging.
- Maintain Tom Baker Cancer Center radiation oncology quality assurance program, as well as conduct quality assurance audits on a routine basis.
- Developed a custom SharePoint enterprise utilizing IaC(Infrastructure as Code) and implemented several API microservices as workflows for custom functionality, such as automated contract renewal reminders, automatic document version control, automatic document archiving. Automatic user experience surveying and reporting.
- Built fully automated CI/CD software in Python for automatic quality assurance analysis, such as the TBCCPylinac Winston-Lutz analysis tool (A tool used to perform calculations of the radiation center offset versus the imaging offset in modern linear accelerators). Reduced lead time for new feature requests by 150%
- Programmed, tested and deployed a centralized monitoring software (MySQL, Python, C#) which gathers key metrics specific to the radiotherapy quality assurance program, and helps identify areas of improvement, as well as predications of future failures.
- Cleared several performance bottlenecks for large-scale software development in Python.
- Mentored 2 junior python developers (Graduate Students) and trained them to work independently.
- Contributed meaningful improvements to existing quality assurance software programs and utilized DevOp philosophies in planning, coding, testing, and scaling prototype software into their final clinical use.
- Advanced expertise and experience conducting research in machine learning algorithms focused on image processing and computer vision for therapeutic and diagnostic medical software development.

2019
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2020

Medical Physics Associate - Junior Physicist

Tom Baker Cancer Centre/Foothills Medical Centre

□ Calgary, Alberta

- Built efficient record keeping with consistency and scale using a mix of MySQL, MongoDB Clusters, as well as user experience testing with our client base that utilizes Microsoft Access.
- 2 Years of SharePoint experience in planning, maintaining and launching servers.
- Helped create feedback systems to facilitate effective communication between hospital clients and medical physics software development team.
- Co-lead the IRIS (Internal Radiotherapy Information Services) department at the cancer centre: Generate and maintain clinical AURA reporting database and SharePoint for the radiation medicine program; develop novel automation software to assist in quality assurance of Varian Linacs; investigate Eclipse 15.6 Visual Scripting environment for developing automation scripts.
- Developed scripts in Python, MATLAB, and Visual Studio C# for automation of quality assurance data and annual quality control measurements.
- Developed an easy-to-use GUI (Software) for Orthovoltage treatment calculations in C# with an MVVM design architecture using Prism, and data binding.
- Developed an easy-to-use highly organized SharePoint 2013 website for the radiation medicine program using HTML5, CSS5, PHP and Javascript modules.

2017
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2019

Graduate Student - Clinical Medical Physics Research

CancerCare Manitoba

□ Winnipeg, Manitoba

Supervisor: Dr. Harry Ingleby

- Designed and tested software in MATLAB and Python for monthly image quality assurance of CT imaging modalities. Tests included implementing finite impulse response validation testing, modulation transfer function, and noise power spectrum analysis for all energies, and imaging protocols. Signal and to noise ratio's tabulated.
- Created reports and presented to department certified medical physicists and engineers for investigation on findings.
- Participated in decision-making with site engineers on how to handle issues and fixes for image quality standards.
- Used Eclipse and Image contouring software by Varian Medical Systems to extract DICOM images, apply reconstruction filters, image segmentation and registration to prepare images for Python/MATLAB software.
- Programmed and developed a routine-based image analysis software in C++ for image segmentation and noise control.
- Wrote an extensive Python/MATLAB algorithm for calculation of modulation transfer function (MTF), Noise Power Spectrum (NPS), and tube current.

2016
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2017

Medical Physics - Data Scientist

University of Manitoba

□ Winnipeg, Manitoba

Supervisor: Dr. Stephen Pistorius

- Main languages used: Python and C#
- Practical and hands-on experience writing software that utilizes machine learning algorithms for signal processing classification problems in python.
- Developed an anthropomorphic breast phantom with accurate dielectric and permittivity properties, suitable for microwave imaging tests.
- Conducted experiments aimed at measuring dielectric and permittivity values of the breast phantoms.

2016

Medical Physics - Data Analyst

CancerCare Manitoba

□ Winnipeg, Manitoba

Supervisor: Dr. Jorge Alpuche

- Inspected user-end testing of Varian Medical systems dose planning interface with eMC (electron Monte Carlo) algorithm.
- Programmed MATLAB script for automatic retrieval of DICOM library for generating PDDs and for performing statistical analysis.

2015
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2016

Organic Chemistry Research Student - Undergraduate Dissertation

University of Manitoba

□ Winnipeg, Manitoba

Supervisor: Dr. John Sorensen

- Built multi-stage, catalysis-driven synthesis of various natural product nitrogen-coupled biomolecules.
- Verified results and purity of compounds through NMR classification, crystallization and chromatography.
- Gained exotic-NMR experience on synthesized Forskolin analogues.

2015 2013	<ul style="list-style-type: none"> ● MySpace - Video Optimization Programmer Volunteer <ul style="list-style-type: none"> • Enhanced video quality and optimization for faster loading. • Worked on yearlong project creating interface with core SQL databases, and Dreamweaver. • Professionally utilized the following programming languages to complete all projects at a timely manner excelling the organizations deadlines: Javascript, HTML, CSS, ActionScript and Apache development.
2010 2008	<ul style="list-style-type: none"> ● Skills Canada SASK - IT Systems Unpaid Internship <ul style="list-style-type: none"> • Participated at the Provincial Skills Canada competition for Engineering Design - awarded first place in Saskatchewan. • Ensured data safety, worked closely with colleagues from other departments and performed multiple key security integrity checks. • Experienced Linux programming, and database inquiries using the linux terminal. • Helped QA automation code to ensure data safety on a regular basis, and helped orient new students at the high school level about website development and HTML programming.

PROFESSIONAL CONFERENCES

2019	<ul style="list-style-type: none"> ● Varian ESAPI Workshop Development of Software/scripts using Visual Studio and C# within the Varian Eclipse API environment. <div>□ (Online)</div>
2019	<ul style="list-style-type: none"> ● Artificial Intelligence & Machine Learning (AI&ML) Visualizing the advancement of AI over the years. <div>□ (Online)</div>
2019	<ul style="list-style-type: none"> ● Eclipse Scripting API: A Guide for Beginners An Eclipse scripting guide taught by Varian Medical Systems. <div>□ (Online)</div>
2019	<ul style="list-style-type: none"> ● Eclipse Scripting API: Quick Wins An Eclipse scripting webinar on dose metrics and DVH apps. <div>□ (Online)</div>
2019	<ul style="list-style-type: none"> ● Eclipse Scripting-Introduction to Automation and Visual Scripting An Eclipse scripting webinar taught by varian as an introduction to Visual scripting and the various API's available for clinical and research use. <div>□ (Online)</div>
2019	<ul style="list-style-type: none"> ● Visual Scripting - Building Effective Action Packs <div>□ (Online)</div>

REFERENCE

<ul style="list-style-type: none"> ● Available Upon Request. 	<div>□</div>
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