

ISAAC TOLULOPE OLATUNJI

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EDUCATION

- Rochester Institute of Technology, Rochester, USA, 2021 – 2023
 - **Master of Science in Bioinformatics**
- College of Medicine of the University of Lagos (CMUL), Lagos, Nigeria, 2009-2016.
 - **Bachelor of Dental Surgery (BDS)**

PUBLICATION(S) AND PROJECT(S)

- Olatunji I and Cui F (2023) **Multimodal AI for prediction of distant metastasis in carcinoma patients.** *Front. Bioinform.* 3:1131021. doi: 10.3389/fbinf.2023.1131021
- Isaac Olatunji, Feng Cui. **Machine Learning Predicts Genes Associated with Cancer Metastasis.** Poster Presentation. AI@RIT Summit.
- Isaac Olatunji. **Potential application of tumor suppressor microRNAs for targeted therapy in head and neck cancer:** A mini-review. *Oral Oncology*, Volume 87, 2018, Pages 165-169, ISSN 1368-8375.
- **Breast Cancer Segmentation on Histopathology Images.** A Convolutional Neural Network based project where U-net architecture was coded from scratch using tensorflow, and other python libraries. Model was trained with image datasets downloaded from Kaggle to make predictions.
- **Differential gene expression analysis in sulphoraphane treated versus vehicle treated obese rats.** Aim was to investigate if any of the Differentially Expressed Genes (DEGs) are related to the leptin receptor or Nuclear Factor Erythroid 2 Related Factor (NRF2) pathways. Data acquisition from SRA, Quality Control, Alignment, Count Matrices, Differential Gene Expression Analysis, Visualization, DEGs interpretation.
- **Assessment of ligand protein binding in statins-HMG Co-A reductase complex.** Molecular docking of various statin class ligands (ex. simvastatin, pravastatin, etc) to the HMG Co-A reductase protein using AutoDock Vina in the PyRx software in order

to assess their binding affinities. Visualization and analysis of the various statin-HMG Co-A complex interactions based on features like hydrophobicity, and B factor in the UCSF Chimera software.

- **Machine Learning Predicts Cancer Recurrence and Metastasis in Head and Neck Cancer.** A project in R that assessed ability of three types of machine learning algorithm (Naïve Bayes, SVM- with linear, polynomial, radial basis kernel functions, and Random Forest) to accurately predict cancer recurrence and metastasis from patients clinical data downloaded from TCGA.
- **Molecular Modelling and Proteomics Course Individual Projects**
 - Python implementation of Chou Fasman algorithm for protein secondary structure prediction.
 - Sequence specific retention calculator for calculation of retention time in reverse phase chromatography.
 - Python scripts within Chimera software for download and manipulation of PDB data.
- **Diagnose Your Toothache.** A novel algorithm to diagnose pain of dental origin from information about patient's symptoms, and medical history. (Python, MySQL)

JOURNAL REVIEW ACTIVITIES

- Reviewer, Journal of Surgery and Operative Care (online journal).
- Reviewer, Journal of Cervical Cancer Research (online journal).
- Reviewer, Journal of Medical Oncology (online journal).
- Reviewer, Journal of Clinical Oncology and Cancer Research (online journal).
- Reviewer, Journal of Otolaryngology, Head and Neck Cancer (online journal).
- Reviewer, Springer book proposal (Medicine, Life Sciences and Biomedicine).
- Reviewer, Journal of Receptors and Signal Transduction (online journal).
- Reviewer, Acta Biochimica Polonica (online journal).

SKILLS

- **Programming Languages:** Python, R, C / C++, SQL, Linux.
- **Libraries and Tools:** Pandas, NumPy, Matplotlib, Sklearn, OpenCV, Keras, TensorFlow, Pytorch, OpenSlide, Tiatolbox, PathML, HISAT2, DESEQ2, Modeller, PyRx, Chimera.
- **Databases:** MySQL, Google BigQuery.
- **Concepts:** Machine Learning, Deep Learning, Convolution Neural Network, Graph Neural Network, Transformer, Molecular Biology, Genomics, Proteomics, Computational Pathology, Algorithms, Statistics, Dentistry, Medicine.

WORK EXPERIENCE

- **Research Assistant, Feng Cui Lab, Jun 2023 – Present:**

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- Application of AI techniques for analysis of biomedical data
 - Literature review.
 - Research.
 - **Graduate Teaching Assistant, General Biology Laboratory, Jan 2022 - Dec 2022:**
 - Delivered lab instructions to two classes of twenty-eight students.
 - Graded student's submissions.
 - Held office hours.
 - **Dental Team Lead, EHA Clinics, 2019-2021:**
 - Diagnosis and treatment of patients with oral and maxillofacial diseases.
 - Administrative duties and communication between the dental department and upper management.
 - Actively involved in writing of standard operating procedures.
 - Worked with the Informatics team to create a digitized dental patient evaluation form.

AWARDS / RECOGNITIONS

- Google CS Research Mentorship Program (CSRMP), 2023.
Mentorship from Google Researchers towards a computer science research career
- Google PhD Fellowship Summit Invited CSRMP Alumni, 2023.
- John Wiley Jones Scholarship for International Students, 2022.
- Bioinformatics Department Merit Scholarship, 2021.

LEADERSHIP SERVICES

- Dental Team Lead, EHA Clinics, 2021.
- Member, Constitution Review Committee, Medical Community Development Service group, Bauchi state, 2018.
- Medical Advisory Chairman, National Youth Service Corps orientation camp clinic, Bauchi state, 2017
- Pioneer member, University of Lagos Association of Dental Students (ULADS) Senate, 2014/2015
- Chairman, Ethics and Disciplinary Committee, University of Lagos Association of Dental Students (ULADS) Senate, 2014/2015

EXTRACURRICULAR ACTIVITIES

- Head Coach of undergraduate class football team for 3 years (2013-2015):
 - Won the ULADS cup with the team twice and came 1st runner-up once.
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- Decided tactics, lead training sessions, players selection and co-ordination, man management.
 - Football management games and other video games
 - Singing