

Mohammed Hamdan, Ph.D.

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[\[LinkedIn\]](#) | [\[GitHub\]](#)

Professional Summary

Innovative researcher in **Machine Learning (ML)** and **Computer Vision (CV)** with a Ph.D. from École de Technologie Supérieure (ÉTS). Specializing in deep learning architectures for handwriting recognition, Optical Character Recognition (OCR), and document layout analysis, I developed the HAND architecture that reduced error rates below 5% on complex handwritten datasets. My expertise encompasses advanced vision transformers (ViT), hierarchical attention networks, GANs, and NLP-based text analysis, resulting in high-impact publications (IEEE TPAMI, Pattern Recognition, IJDAR). Skilled at translating state-of-the-art research into deployable solutions, managing research infrastructures, and mentoring peers. Passionate about multimodal integration, sensor fusion, scalable MLOps pipelines, and fostering innovation across academia and industry.

EDUCATION

Software Engineer (ML-Computer Vision), [École De Technologie Supérieure](#)
September 2019 - November 2024

Computer Science (NLP), [King Abdulaziz University](#)
March 2015 - May 2018

Computer Science, [University of Hail](#)
April 2009 - August 2013

Languages

Arabic: Native or bilingual proficiency

English: Professional proficiency

French: B1 - Independent user

SKILLS

- **Data Structures:** Sorting, Recursion, Trees, Graphs, Dynamic Programming, Ad-hoc, Linked Lists, Stacks, Queues, and Strings.

- **Programming languages:** For machine learning and Data science (Python, R), and basic knowledge of Java, C#, C++, VB.net, Matlab, and Octave.
- **Deep Learning Framework:** Tensorflow, PyTorch, Keras, PyTorch Lightning, Theano, Caffe, and mxnet.
- **Website Development:** WordPress, Bootstrap, MySQL, PHP, HTML, CSS, JQuery, and Javascript.
- **GPU Programming:** Compute Canada servers like mist, Niagra, etc., Calcul Quebec like Narval, Lambda server, AWS, GCP, and Kaggle.
- **Organizational and planning skills:** communication skills, teamwork, data collection and management, attention to detail, problem analysis, and initiative confidentiality.

EXPERIENCE

- Researcher as a Ph.D. candidate in Synchronmedia Lab, ETS, Canada, March 2020 – present. The main focus is on using machine learning and computer vision algorithms to recognize and analyze document (handwriting) images.
- The administrator of Synchronmedia Lab, ETS, Canada, July - 2020 - present.
- Build a website for our [Synchronmedia](#) lab as a volunteer in 2022.
- ADMINISTRATIVE ASSISTANT as a part-time job at Scientific Council, Committee of Scientific Promotion at KAU, Jeddah, Saudia Arabia, January 2016 - May 2017.
- Website Developer using ASP.net with C#, in Transportation company, Jeddah, Saudia Arabia, January 2014 - March 2016.
- Researcher in Water Researching Center, Civil engineering department, King Abdelaziz University, Jeddah, Saudi Arabia, January 2015 - December 2015.
- Web Developer using PHP and Mysql, at Hail university, faculty of science and software engineering, Hail, Saudia Arabia, January 2011 - April 2012.
- Technical support in Computer Hardware & Software Maintenance, Computenet foundation, Hail, Saudia Arabia, January 2011 - March 2012.
- Developing real estate websites, Al-Monahi & Aldalil offices, Hail, Saudi Arabia, February 2013 - April 2013.

Relevant courses

1. **Image Processing** (COMP6771), [University of Concordia](#), Autumn 2018.
2. **Machine Learning**, Taught by Andrew Ng, offered by Sandford Univerity on [Coursera](#).

3. **Machine Learning Engineering for Production (MLOps) Specialization**, taught by Andrew Ng, Laurence Moroney, and Robert Crowe, offered by DeepLearning.AI on Coursera, contains the following [courses](#):

- Introduction to Machine Learning in Production.
- Machine Learning Data Lifecycle in Production.
- Machine Learning Modeling Pipelines in Production.
- Deploying Machine Learning Models in Production.

4. **Deep Learning with PyTorch: Zero to GANs**, by [Jovial](#).

5. **Artificial intelligence engineer with eight projects**), [Simplilearn](#), June 2020 - March 2021. **Skills and project achieved:**

- **Introduction to Artificial Intelligence:** decoding AI, fundamentals of ML and DL, ML workflow, and performance metrics.
- **Data Science with Python:** intro to data science, intro to data analysis, statistical analysis and business applications, python for data science, mathematical computing with python (Numpy), scientific computing with python (Scipy), data manipulation with Pandas, ML with Scikit-learn, NLP with Scikit-Learn, Data visualization in Python using matplotlib, web scrapping with beautiful soup, and Python integration with Hadoop MapReduce and Spark.
- **Machine Learning:** intro to AI and ML, data preprocessing, supervised learning, feature engineering, supervised learning classification, unsupervised learning, time series modeling, ensemble learning, recommender systems, and text mining.
- **Deep Learning Fundamentals:** intro to deep learning, deep learning models, additional deep learning models, and deep learning platforms and libraries.
- **Deep learning with Keras and TensorFlow:** intro to DL with Keras and TF, ANN, DNN, DNN optimization tuning interpretability, CNN, RNN, and autoencoders.
- **Natural Language Processing:** intro to NLP, working with text Corpus, processing raw text with NLTK, text classification, finding useful information from piles of text, and developing a speech-to-text application using Python.
- **Projects achieved:**
 - Project 1. **IBM HR Analytics Employee Attrition Modeling**
 - Project 2. **House Loan Data Analysis**
 - Project 3. **Building a user-based recommendation model for Amazon**
 - Project 4. **Identify the level of income qualification needed for families in Latin America**
 - Project 5. **Topic Analysis of Review Data**
 - Project 6. **Classify Hate vs. Nonhate Tweets**
 - Project 7. **Customer Service Requests Analysis**
 - Project 8. **AI Capstone Project held Finance, Retail, and E-commerce**
 - **GitHub hosts my projects, and labs are [here](#)**

6. **Advanced Certification Program in AI/ML, [IIIT Hyderabad ML Lab](#)**, September 2020 - March 2021. For more than a 6-month program. A lot of it was programming - learning Python, hacking voice skills on Alexa, Stock price prediction, Recommendation Systems, and learning to build models. But the most significant learning has been the ideal thinking behind ML algorithms - a constant focus on improving the performance of models while simplifying the inputs and features needed. Eventually, since ML is over fifteen years of history, therefore, my feeling is just like I've barely touched the tip of the iceberg of that history, and learning this is just opening new challenging doors in the field of ML/AI. **Hackathons achieved:**

- Hackathon 1. **Voice Commands Based Ordering System**
- Hackathon 2. **Alexa Chatbot**
- Hackathon 3. **Expression Face Recognition - Mobile App**
- Mini-Hackathon 1. **Data Munging**
- Mini-Hackathon 2. **Aptitude Classification**
- Mini-Hackathon 3. **Author Identification**
- Mini-Hackathon 4. **Research Investigators Clustering**
- Mini-Hackathon 5. **Dogs vs. Cats Binary Class Classification with PyTorch**
- Mini-Hackathon 6. **Image Transformations - Kaggle Competition**, Kaggle [here](#)
- Mini-Hackathon 7. **Sales Forecast - Kaggle Competition**, Kaggle [here](#)
- GitHub hosts my Hackathons, Mini-Hackathons and labs are [here](#)

7. **Deep Learning with PyTorch OpenCV course with four Projects**, July 2020 - January 2021. **Skills and project achieved:**

- **Week1 -Getting started:** intro to Artificial Intelligence, Numpy refresher, assignments on Numpy and PyTorch, ML algorithms, assignment on Gradient descent [here](#).
- **Week2 - Neural Networks:** intro to NN, from 1D to ND, neural network basics, binary classification using perceptrons, PyTorch NN Module, image classification using a multi-layer perceptron, and assignment on MSE vs. MAE.
- **Week3 - Convolutional Neural Networks:** inside CNN, lab: implement LeNet using PyTorch, evaluation of classification performance, intro to Torchvision, important CNN architectures, assignment on implementing CNN for image classification on CIFAR10, and a quiz to solidate my understanding.
- **Week4 - Practical considerations for training deep neural networks:** optimization, training deep networks, adding robustness to the model, applying custom dataset, and assignment on Adam optimizer implementation.

- **Week5 - Project1:** Implement an image classifier from scratch.
- **Week6 - Best practices in deep learning:** troubleshooting training with Tensorboard, leveraging pre-trained models, how to structure your project for scale, and PyTorch Lightning.
- **Week7 - Project2:** Kaggle competition - classification, and quiz 2.
- **Week8 - Object detection:** intro to object detection, evaluation of traditional algorithms, and two-stage object detectors.
- **Week9 - Single Stage Object Detection:** intro to object detection, YOLO: You Look Only Once, SSD: Single Shot MultiBox Detector, RetinaNet, custom SSD, and assignment on implementing the focal loss.
- **Week10 - Project3:** object detection.
- **Week11 - Segmentation:** intro to segmentation, semantic segmentation architectures, evaluation metrics for semantic segmentation, LinkNet for semantic segmentation, Loss for semantic segmentation, FCN and DeepLab hands-on, U-Net hands-on, training from scratch, instance segmentation, and assignment on LinkNet with VGG16.
- **Week12 - Project4:** Kaggle Competition - Semantic Segmentation and quiz.
- **Week13 - Pose Estimation:** intro to densepose, densepose inference, training, squat checker, pose estimation.
- **Week14 - Azure deployment and cognitive services:** deployment, azure cognitive services, and deployment on Azure using GitHub repository.
- **Week15: LibTorch:** intro to Torchscript, intro to Libtorch, and intro to ONNX.
- **project achieved:**
 - Project 1. **Implement a CNN-based Image Classifier From scratch with PyTorch**
 - Project 2. **Kaggle Competition Classification**, Kaggle link [here](#)
 - Project 3. **Object Detection of Automatic Number Plate Recognition**
 - Project 4. **Kaggle Competition - Semantic Segmentation**, Kaggle link [here](#)
 - GitHub hosts my labs, and projects are [here](#)

8. **PyImageSearch Customers - PyImageSearch Gurus Course**, November 2020 - November 2022, **Skills achieved:** By completing 13 modules and multiple tests in

2 years, I gained an understanding of computer vision, and the fundamentals of computer vision algorithms include:

- **Module 1. Computer vision basics:** loading, displaying, and saving images; image basics; drawing, basic image processing; kernels, morphological operations; smoothing and blurring; lighting and color spaces; thresholding, gradient, and edge detection; contours, histograms, and connected-component labeling.
- **Module 2. Building your custom object detector:** what is your object detector, object detection as the easiest way, sliding windows and image pyramids, the 6-step framework, constructing your HOG descriptor, the initial training phase, non-maxima suppression, hard-negative mining, retraining and running your classifier, training your custom object detector, and tips on training your own object detectors.
- **Module 3. Content-based Image Retrieval (CBIR):** what is CBIR, the 4 steps of building an image search engine, the bag of visual word model, extracting key points and local invariant descriptors, clustering features to form a codebook, visualizing words in a codebook, vector quantization, inverted indexing and searching, evaluation, Tf-idf weighting, and spatial verification.
- **Module 4. Image Classification and Machine Learning:** A high-level overview of image classification, the image classification pipeline, K-Nearest Neighbor classification, common machine learning algorithms for image classification, K-means clustering, a bag of visual words for classification, a different type of image pyramid, an image classification example: Flower-17, an image classification example: CALTECH-101, and tips on training your image classifier.

- **Module 5. Face Recognition:** What is Face Recognition?, LBPs for Face Recognition, the Eigenfaces Algorithm, Preparing and Preprocessing Your Own Face Dataset, and the Complete Face Recognition Pipeline
- **Module 6. Automatic License Plate Recognition (ANPR):** What is ANPR, the problem with the ANPR dataset, localizing license plates in images, segmenting characters from the license plate, scissoring the license plate characters, gathering your license plate dataset, improving the proposed license plate model, and tips on classifying your license plate dataset.
- **Module 7. Hadoop and Big Data:** introducing Hadoop and MapReduce, setting up Hadoop on the local machine, preparing dataset images on HDFS, running computer vision jobs on MapReduce, high-throughput face detection, and high-throughput feature extraction.
- **Module 8. Deep Learning:** intro to deep learning, neural networks in a nutshell, setting up a deep learning development environment, deep belief networks, convolutional neural networks, implementing CNN architectures, transfer learning, working with Caffe, and Tips on training your own networks.
- **Module 9. Raspberry Pi Projects:** installing OpenCV on your Raspberry Pi, setting up your Raspberry Pi Camera, accessing the Raspberry Pi camera and video stream, home surveillance and motion detection, and face recognition for security.
- **Module 10. Image Descriptors:** what are image descriptors, feature vectors, color channel statistics, color histograms, Hu moments, Zernike moments, Haralick texture, Local Binary Patterns (LBPs), Histogram of Oriented Gradients (HOGs), understanding local features, Keypoint detectors (FAST, Harris, GFTT, DoG, Fast Hessian, STAR, MSER, Dense, BRISK, ORB), Local invariant descriptors (SIFT, RootSIFT, SURF, Real-valued feature extraction, and matching), Binary

descriptors (BRIEF, ORB, BRISK, FREAK, Binary feature extraction, and matching).

- **Module 11. Computer Vision Case Studies:** measuring distance from the camera to object in an image, face detection in images, face detection in video, object tracking in video, identifying the covers of books, plant classification, and handwriting recognition.
- **Module 12. Building Computer Vision Apps on mobile devices:** intro to PhoneGap, PhoneGap environment setup, PhoneGap "Hello, World," PhoneGap UI setup, capturing and uploading a photo with PhoneGap, and displaying face detection results.
- **Module 13. Hand Gesture Recognition:** intro to hand gesture recognition, hand, finger, motion segmentation, and recognizing gestures.

9. **PyImageSearch University ImageNet Bundle - Deep Learning for Computer**

Vision with Python, March 2020 - Present, **Skills achieved:**

- Starter bundle book using TensorFlow and Keras.
- Practitioner bundle book using TensorFlow and Keras.
- ImageNet bundle book using TensorFlow and Keras.
- Bonus bundle book using TensorFlow and Keras.

10. **PyImageSearch University Full Access Plan**, March 2020 - Present, **Skills achieved:**

- **OpenCV 101 — OpenCV Basics:** displaying images, translation, rotation, resizing, flipping, cropping, image arithmetic, and bitwise operations.
- **OpenCV 102 — Basic Image Processing Operations:** morphological operations, smoothing and blurring, color spaces, basic thresholding, adaptive thresholding, kernels, image gradients, edge detection, automatic edge detection.
- **OpenCV 104 — Histograms:** image histograms, histogram, adaptive histogram equalization, histogram matching, gamma correction, automatic color correction, and detecting low contrast images.
- **Augmented Reality 101 — Fiducials and Markers:** aprilTag detection, generating ArUco markers with openCV, detecting ArUco markers with OpenCV, automatically determining ArUco marker type, augmented reality with ArUco markers, and real-time augmented reality with OpenCV.
- **Deep Learning 101 — Neural Networks and Parameterized Learning:** what is deep learning, image classification basics, the deep learning classification pipeline, parameterized learning and neural networks.
- **Deep Learning 102 — Optimization Methods and Regularization:** understand and implement gradient decent, stochastic gradient descent (SGD), gradient descent algorithms and variations, and regularization techniques.

- **Deep Learning 103 — Neural Network Fundamentals:** introduction to neural networks, implementing the perceptron neural network with python, backpropagation from scratch with python, implementing feedforward neural networks with keras and TensorFlow, the 4 key ingredients when training any neural network, and understanding the weight initialization for neural networks.
- **Deep Learning 104 — Convolutional Neural Networks (CNNs):** convolution and cross-correlation in neural networks, convolutional neural networks (CNN) and layer types, are CNNs invariant to translation, rotation, and scaling.
- **Deep Learning 105 — Hands-on Experience with CNNs:** guides to train CNN with Keras and TensorFlow, save/load models to/from disk, LeNet for MNIST classification, MiniVGGNet going deeper CNNs, visualizing network architectures using Keras and TensorFlow, pretrained CNNs for image classification, fast neural network training with distributed training and Google TPUs, and U-Net image segmentation in Keras.
- **Deep Learning 106 — Improving Accuracy of CNNs:** Handling model checkpoint callback, Keras learning rate schedules and decay, the trade off between overfitting and underfitting.
- **Deep Learning 107 — Basic Real-World Projects:** breaking captchas with deeplearning, Keras and TensorFlow; smile detection with OpenCV Keras, and TensorFlow; traffic sign classification with Keras and deep learning, and Fashion MNIST with Keras and deep learning.
- **Deep Learning 120 — Regression with CNNs:** regression with neural network, regression with CNNs, combining categorical, numerical, and image data into a single neural network.

- **Deep Learning 125 — Data Pipelines with tf.data:** introduction to tf.data with tensorflow, data pipeline with tf.data and Tensorflow, and data augmentation with tf.data and Tensorflow.
- **Deep Learning 130 — Hyperparameter Tuning:** intro to hyperparameter tuning, hyperparameter tuning for computer vision projects, using scikit-learn to tune deep learning model hyperparameters and easy hyperparameter tuning with Keras Tuner.
- **Deep Learning 301 — Advanced Topics:** Computer graphics and deep learning with NeRF using TF and Keras part 1 - 3, introduction to TFRecords.
- **PyTorch 101 — Fundamentals of PyTorch:** intro to PyTorch, neural network with PyTorch, train CNN with PyTorch, image classification with pretrained networks and PyTorch, and object detection with pre-trained networks and PyTorch.
- **PyTorch 102 — Intermediate PyTorch for CV techniques:** DataLoader for image data, transfer learning and image classification, and introduction to distributed training in PyTorch.
- **PyTorch 103 - Advanced PyTorch techniques:** training DCGAN in PyTorch, training an object detector from scratch in PyTorch, U-Net: training image segmentation models.
- **Siamese Networks 101 — Intro to Siamese Networks:** building image pairs for siamese networks, implementing siamese network with Keras and TensorFlow, comparing image for similarity with siamese networks, improving accuracy with contrastive loss.

- **Image Adversaries 101 — Intro to Image Adversaries:** adversarial and attacks with Keras TensorFlow, targeted adversarial attacks with Keras and TensorFlow, adversarial attacks with FGSM (Fast Gradient Signed Method), defending against adversarial attacks and mixing normal images and adversarial images when training CNNs.
- **Autoencoders 101 — Intro to Autoencoders:** autoencoders with Keras and Tensorflow, denoising autoencoder, anomaly detection with autoencoders, and autoencoders for content based image retrieval (CBIR).
- **Object Detection 101 — Easy Object Detection:** shape detection with OpenCV, template matching with OpenCV, multi-template matching, multi-scale template matching, haar cascades with OpenCV, deep learning object detectors with OpenCV, and real-time deep learning object detection with OpenCV.
- **Object Detection 201 — Fundamentals of Deep Learning Object Detection:** turning any deep learning image classifier into an object detector, selective search for object detection, region proposal object detection, and training R-CNN object detectors.
- **Object Detection 202 — Bounding Box Regression:** bounding box regression, multi-class bounding box regression.
- **Face Applications 101 — Face Detection:** face detection with haar cascades, deeplearning faced detection with OpenCV, deep learning face detection with Dlib, and choosing a face detection method.
- **Face Applications 102 — Fundamentals of Facial Landmarks:** facial landmark with Dlib and OpenCV, detecting eyes, nose, lips, and jaw with OpenCV, real-time facial landmark detection, and 5-points facial landmark detection.

- **Face Recognition 101 — Fundamentals of Facial Recognition:** intro to face recognition, face recognition with local binary patterns, OpenCV eigenfaces for face recognition.
- **GANs 101:** intro to generative adversarial networks (GANs), DCGAN for fashion-MNIST, GAN training challenges: DCGAN for color images, anime faces with WGAN and WGAN-GP.
- **GANs 201:** super-resolution generative adversarial networks (SRGAN), enhanced super-resolution generative adversarial networks (ESRGAN), and image translation with Pix2Pix.
- **GANs 301:** CycleGAN: unpaired image-to-image translation, part 1.
- **OCR 101 — Fundamentals of Optical Character Recognition:** intro to Optical Character Recognition (OCR), using Tesseract, PyTesseract, and Python OCR, OCR project with Tesseract and Python.
- **OCR 110 — Using Tesseract for Translation and Non-English Languages:** detecting and OCR'ing digits with Tesseract and PyThon, whitelisting and blacklisting characters with Tesseract and Python, correcting text orientation with Tesseract and Python, Language translation and OCR with Tesseract and Python, and using Tesseract with non-English languages.
- **OCR 120:** tesseract page segmentation models (PSMs) to improve OCR accuracy, improve OCR results with image processing, using spellchecking to improve Tesseract OCR accuracy, OCR passports with OpenCV and Tesseract, and credit card OCR with OpenCV and Python.
- **OCR 130:** recognizing digits with OpenCV and Python, Tesseract OCR: text localization and detection, rotated text bounding box localization with OpenCV, and a complete text detection and OCR pipeline.

- **OCR 201:** OCR with Keras, TensorFlow, deeplearning, Handwriting recognition with Keras and Tensorflow, and using machine learning to denoise images for better OCR accuracy.
- **OCR 210 — EasyOCR, Aligning Documents, and OCR'ing Documents:** making OCR “easy” with easyOCR, image/document alignment and registration, OCR'ing a document, form, or invoice.
- **OCR 220:** sudoku solver and OCR, automatically OCR'ing receipts and scans, OCR'ing business cards, OpenCV automatic license/number plate recognition (ANPR) with Python.
- **OCR 230 — Optical Character Recognition with Python:** multi-column table OCR, OpenCV Fast Fourier Transform (FFT) for blur detection in images and video streams, OCR'ing video streams, and improving text detection speed with OpenCV and GPUs.
- **OCR 240 — Text Detection and OCR:** text detection and OCR with Amazon recognition API, text detection and OCR with Microsoft cognitive services, and text detection and OCR with Google cloud vision API.
- **Visual Fusion For Autonomous Cars:** intro to visual fusion, understand cameras, understand LiDARs, review of the 2 sensors, introduction to sensor fusion, point pixel projection, projection of a LiDAR point (3D) to an image (2D), and applying the magic formula using Google Colab.
- **Super Resolution 101 — Introduction to Super Resolution:** OpenCV super resolution with deep learning, image super resolution, pixel shuffle super resolution with TensorFlow, Keras, and deep learning.

- **Object Detection 301 — The YOLO Object Detector:** intro to YOLO family, understanding a real-time object detection network: You Only Look Once (YOLOv1), a better, faster, and stronger object detector (YOLOv2), mean average precision (mAP) using the COCO evaluator, and incremental improvement with darknet-53 and multi-scale predictions (YOLOv3), achieving optimal speed and accuracy in object detection (YOLOv4), and training the YOLOv5 object detector on a custom dataset.
- **NLP 101:** intro to Natural Language Processing (NLP), intro to Bag-of-Words (BoW) model, Word2Vec a study of embeddings in NLP, and comparison between BoW and Word2Vec.
- **NLP 102:** intro to Recurrent Neural Networks with Keras and TensorFlow, Long Short-Term Memory (LSTM) networks, and Neural Machine Translation (NMT).
- **NLP 103:** Neural Machine Translation with Bahdanau's attention using tensorflow and Keras, Neural Machine Translation with Luong's attention using TensorFlow and Keras.
- **NLP 104:** a deep dive into transformers with TensorFlow and Keras (part 1 - 3)
- **Torch Hub 101 — Practical Applications of Torch Hub:** intro to Torch Hub, VGG and ResNet, YOLOv5 and SSD models on object detection, PGAN model on GAN, MiDaS model on Depth estimation, and image segmentation.
- **HydraNets & Multi-Task Learning for Autonomous Vehicles with PyTorch:** intro to multi task learning and hydranets, mini-project starter, implementing multi-task learning, hydranets in computer vision, hydranets for self-driving cars mini-project, encoder & decoder fast building, building the encoder mobilenetv2, building the decoder lightweight refinenet, and running the HydraNet.

- **How to Publish Novel Research:** choosing the research topic and reading its literature, ideating the solution and planning experiments, planning and Writing a research paper, planning next steps when things don't work out, ensuring the research stays visible, and other general tips.
- **Infrared Vision Basics:** intro to infrared vision, near vs mid-far infrared images, thermal vision: measuring temperature from an image with python and OpenCV, thermal vision: fever detector with Python and OpenCV (starter project), thermal vision: night object detection with Pytorch and YOLOv5(real project)
- **Spatial Transformer Networks Using TensorFlow:** spatial transformer networks using TensorFlow a complete guide.
- **Attending to Channels Using Keras and TensorFlow:** attending to channels using Keras and TensorFlow a complete tutorial.
- **CV and DL for Industrial and Big Business Applications 101:** computer vision and deep learning for government, CV and DL for customer service, CV and DL for banking and finance, CV and DL for agriculture, and CV and DL for electricity.
- **CV and DL for Industrial and Big Business Applications 102:** CV and DL for oil and gas, CV and DL for transportation, CV and DL for logistics.

ONLINE COURSES AND CERTIFICATES on Udemy

- WordPress for Beginner- Master WordPress Quickly on May 27, 2020.
- The Complete Web Developer Course 2.0 on May 22, 2020.
- SEO 2020 - Safe, Effective Search Engine Optimization on May 26, 2020.
- Deep Learning for Computer Vision with TensorFlow and Keras on Oct. 24, 2019.
- Deep Learning: Recurrent Neural Networks in Python on Sept. 12, 2019.
- PyTorch for Deep Learning with Python Bootcamp on Nov. 2019.
- Deep Learning with Pytorch zero to GANs on Oct. 11, 2019.
- Deep Learning and Computer Vision A-Z: OpenCV, SSD & GANS on Aug. 29, 2019.
- Practical Deep Learning with PyTorch on Aug. 17, 2019.

- Matplotlib Complete Tutorial | Machine Learning Pre-requisite on Sept. 29, 2019.
- A gentle Introduction to Deep Learning Using Keras on Oct. 16, 2019.
- Deep Learning: Visual Exploration on Oct. 15, 2019.
- Learning Machine Learning algorithms, software, and deep learning on Oct. 15, 2019.
- Unsupervised Deep Learning in Python on Sept. 13, 2019.
- Python from Beginner to Intermediate Sept. 30, 2019.
- Complete Machine Learning - Learn From Scratch on Sept. 29, 2019.
- The top 5 Machine Learning Libraries in Python on Sept. 24, 2019.

IN PROGRESS, AN INCREMENTAL LEARNING

- Web Programming with Python and JavaScript by MIT & HARVARD university.
- Artificial Intelligence Engineer Program in Coursera organized by IBM.
- Deep Learning and Computer Vision Course organized by MIT.
- IBM Applied AI Professional Certificate.
- Deep Learning Specialized in Coursera by Andrew Ng.
- TensorFlow Developer Professional [Certificate](#)

Academic Awards

- Certificate of Excellence, Faculty: Computing & information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2014-2015, Has achieved a GPA of "Excellent" in both successive semesters of the academic year 2015-2016.
- Certificate of Excellence, Faculty: Computing and Information information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2015- 2016, Has achieved a GPA of "Excellent" in both successive semesters of the academic year 2015-2016.
- Certificate of Attendance Map of professional technical courses, Faculty: Computing & information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2015-2016, Has attended this course of the academic year 2015-2016.

Publications

- Hamdan, Mohammed H., and Imtiaz H. Khan. "An analysis of prepositional-phrase attachment disambiguation." *International Journal of Computational Linguistics Research* 9, no. 2 (2018): 60-80, IF: 2.27.
- Hamdan, M., Chaudhary, H., Bali, A., & Cheriet, M. (2022). Refocus attention span networks for handwriting line recognition. at: *International Journal on Document Analysis and Recognition (IJDAR)*, IF: 3.870.
- Hamdan, Mohammed, Mr Chaudhary, and Mohamed Cheriet. (2022) "Transformer-Based Joint Attention Segmentation-Free for End-to-End Handwriting Paragraph Recognition

Model." Mohamed, Transformer-Based Joint Attention Segmentation-Free for End-to-End Handwriting Paragraph Recognition Model. Journal of Neurocomputing, IF: 5.71.

Courses-based Projects

- Project name: **Deep Tsundoku**, August 2022 - September 2022. Role: **Team member**
About the project: Deep Tsundoku is a bookshelf app that combines the serendipity of looking through real books with modern ways to find information. GitHub code is [here](#), and Huggingface is hosting the model [here](#).
- Project name: **Corpus-based PP-attachment Ambiguity Resolution in Arabic script**, Aug 2015. Role: **team member**. The project focuses on two significant linguistic ambiguities: prepositional phrase attachment and word sense ambiguity. We present a new supervised learning technique for PP-attachment based on a corpus that has been semantically annotated. King Abdul- Aziz University, Jeddah, KSA. Other members: Ebtesam S.Bashammakh² Areej Y. Bayahya³, Majed Al- Ghamdi, Dr. Imtiaz H. Khan⁵ P.G. Student, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia, Ebtesam.BaShammakh@gmail.com, Arigyahya@gmail.com, mj87mj@hotmail.com.
- Project name: **Handwritten Recognition in Arabic scripts based using Hidden Markov Model Approach**, Aug 2015, Role: Team member. About the project: HMM-based offline cursive Arabic handwriting recognition is addressed. The suggested method uses embedded training-based HMMs to improve character models by considering character context. Analytical without explicit segmentation, retrieved features prior to baseline estimation are statistical and structural to combine text and word image pixel distribution characteristics. King Abdul-Aziz University, Jeddah, KSA Another member: Dr.Abdullah A. S. Basuhail² P.G. Student, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia, mh2015kaugmail.com, Associate Professor, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia abasuhaikau.edu.sa.
- Project name: **An Evaluation Code Metrics in C# based systems**, Aug 2016, King Abdul- Aziz University, Jeddah, KSA. Role: team member. About the project: The difficulty of keeping code trustworthy and maintainable rises in tandem with the complexity of modern software programmes. A group of software metrics known as "code metrics" can help programmers get insight into their work. The use of code metrics helps programmers determine which classes and/or methods need to be refactored or tested more carefully. During software development, teams can track progress, understand the current state of a project, and identify hazards. Another member: Dr. Wajdi Al Jedaibi² P.G. Student, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia, mh2015kaugmail.com. Associate Professor, Department of

Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia waljedaibigmail.com.

- Project name: **Detection Hidden Characters from Vehicles' Plates in Saudi Arabia**, Aug 2015, King Abdul- Aziz University, Jeddah, KSA. Role: team member. About the project: Compared to the methods utilized with license plates abroad, those in Saudi Arabia are less complicated. Recognition trees can be simplified if only a subset of characters is used. When tested with data derived from actual license plates, the devised approach yielded a perfect recognition rate for all characters recognized by the system. Another member: Dr. Abdullah A. S. Basuhail P.G. Student, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia, mh2015kaugmail.com. Associate Professor, Department of Computer Science, Faculty of Computing and Information Technology, Jeddah, Saudi Arabia abasuhaikau.edu.sa.

ADDITIONAL ACTIVITIES

- English Course Intermediate 3, British Council, Jeddah, May 2017, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- English Course Intermediate 1, British Council, Jeddah, Mar 2017, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- English Course Pre-Intermediate 4, British Council, Jeddah, Feb 2017, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- English Course Pre-Intermediate 3, British Council, Jeddah, Dec 2016, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- Hardware & Software Maintenance, Canadian Center for training & Capacity Development, Sana'a, Yemen, Jul 2010, Course in computer hardware and software issues had been taken since 2010. Overall grade Very Good.
- Design & Development Website HTML-CSS- PHP-MySQL, Canadian Center for training & Capacity Development, Sana'a, Yemen, Aug 2010, Course in web development has been taken since 2010. Overall grade Excellent.
- Photoshop-Illustrator-InDesign, Canadian Center for training & Capacity Development, Sana'a, Yemen, Aug 2010, Course in web development had been taken since 2010. Achieving overall grade Excellent.
- Certificate of Attendance The Power of Thinking, ALQADEM TRAINING CENTER, Jeddah, Saudi Arabia, 2010, Has attended 10 hours of training on two days from 20 Jun 2010 to 22 Jun - 2010.
- Certificate of Attendance Map of professional technical courses, Faculty: Computing & information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2015-2016, Has attended this course of the academic year 2015-2016.

- Certificate of Excellence, Faculty: Computing & information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2014-
- 2015, Has achieved a GPA of "Excellent" in both successive semesters of the academic year 2015-2016.
- Certificate of Excellence, Faculty: Computing & information technology, King Abdelaziz University, Jeddah, Saudi Arabia, 2015- 2016, Has achieved a GPA of "Excellent" in both successive semesters of the academic year 2015-2016.
- English Course Pre-Intermediate 1, British Council, Jeddah, Nov 2016, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- English Course Elementary 4, British Council, Jeddah, Sep 2016, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- English Course Elementary 3, British Council, Jeddah, Jun 2016, Course of English Language tuition at the British Council, Jeddah, Achieving the overall grade Excellent Performance.
- Spoken English, Grammar Advanced level 200 hours, London School of Speech, Bangalore, India, Aug 2013, Course of English Language tuition from 10 Jul 2013 to 30 Aug 2013 at the London School of Speech, Bangalore, Achieving the overall grade Excellent Performance.
- Writing an Essay English, One to 1 institution, Bangalore, India, Jul 2013, Course of English Language tuition from 1 to 30 Jul 2013 at One to One institution, Bangalore, Achieving the overall grade Excellent Performance.