Muhammad Hilmi Asyrofi

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🐙 github.com/mhilmiasyrofi | in linkedin.com/in/mhilmiasyrofi/ | Portfolio | Google Scholar
💬 Architecting Machine Learning in the Cloud | Kaggle Data Science Expert | Certified Solution Architect

EXPERIENCES

Machine Learning Engineer
PropertyGuru - Data Science Center of Excellence

Singapore
Jun 2022 - present

- Worked closely with PM and Ops team to understand business problems and translated them into profitable solutions. Collaborated with cross-functional teams to **productionize data science projects as sellable systems to external clients**, e.g. Automated Valuation Model for banks and real estate consultants.
- Developed an Address Matching system to synchronize a physical location with address records in the data warehouse. Leveraged advance natural language processing techniques to **aggregate data from multiple sources to provide rich information from an address**, e.g. property information, property valuation, and property risk assessment. Improved the matching rate by more than 70% compared to the legacy SQL-based string matching.
- **Led cross-team collaboration with data engineers and software engineers** to solve inaccurate address listings in Malaysia. Fixed 150k inaccurate listing data, resulting in more accurate location-based listing recommendations and an estimated six-month revenue increase of over USD100k.
- Led **an initiative to incorporate Trustworthy metrics** in the machine learning systems. Detected and performed root cause analysis on unacceptable fluctuating predictions in a highly critical product. As a result, the volatile predictions were reduced by more than 90%.

AI Research Engineer
School of Computing and Information System, Singapore Management University

Singapore
Nov 2019 - May 2022

- Conducted research on **Trustworthy Artificial Intelligence** supervised by ACM Distinguished Scientist Prof David Lo
- **Published 7 papers** in international conferences and journals, i.e., IEEE TSE (Q1, CCF Rank A, Impact Factor: 9.32), ACM ESEC/FSE (CORE A*), IEEE ICSME (CORE A), and IEEE SANER (CORE A)
- M**aintained machine learning projects** using Dockerized environments running on Nvidia DGX AI Supercomputer

Co-Founder & CTO
Alinamed - Pitch Deck, Playstore

Surabaya, Indonesia
Jan 2019 - Jul 2020

- **Managed the end-to-end software development lifecycle** by collaborating across members, including functional requirements analysis, design specification, technical code review, project planning, and implementation of applications
- Managed the selection of programming languages, frameworks, cloud, web servers, databases, and mobile
- Won prestigious startup competitions, e.g., 1st Winner at WMM by Bank Mandiri, 1st Winner at Startup Weekend Surabaya, Winner at Tech-to-Impact by UK-ID Tech Hub. Secured IDR 750 million investment from Telkom Indonesia

Machine Learning Engineer Intern
Bukalapak

Jakarta, Indonesia
May 2018 - Aug 2018

- Developed object detection as a part of the search-by-image feature. Developed character recognition to detect seller's information (e.g., phone number and Instagram username) in the e-commerce product image. Localized text lines using CTPN (Connectionist Text Proposal Network) and combined bounding boxes of words within the same context.

HONORS & AWARDS

2022 **Bronze Medal | Top 7% (170 from 2,654) | Evaluating Written Essays | NLP |** Kaggle Leaderboard
The challenge was to assess the language proficiency of students by analyzing their written essays. I leveraged DeBERTa language models to extract the feature embeddings from the essays. Then, I trained neural network layers to predict the proficiency scores from extracted features.

2021 **Silver Medal | Top 5% (101 from 2,426) | Shopee Product Matching | NLP + CV |** Kaggle Leaderboard
The task was predicting similar e-commerce products by using product images and titles. I utilized EfficientNet and NFNet to extract feature embeddings from images and utilized BERT and TFIDF to extract feature embeddings from texts. I calculated the cosine distance between products and employed k-NN to find similar products

2021 **Top 3% (28 from 1,034) | Information Extraction - Shopee Data Science Challenge |** Kaggle Leaderboard
The challenge was extracting Point of Interest (POI) names and street names from unformatted Indonesia addresses collected by Shopee. I framed the challenge as NER (Named Entity Recognition), where POI and street are the extracted entities. Then, I fine-tuned the IndoNLU model on the customized dataset.

2019 **Gojek Upscale 02 for Data Science Enthusiast |** Certificate
A complete two-day experience from the Gojek data science team. It covered machine learning, data modeling, and Gojek data science best-practices. I was one of 20 chosen participants out of 1,000 applicants

2011 **Bronze Medal | Mathematics Competition at 2nd National Science Camp |** Certificate
Awarded by Ministry of Education - Indonesia

EDUCATION

Institut Teknologi Bandung (ITB)
Bachelor of Computer Science

Bandung, Indonesia
2015 - 2019

- **Cum Laude** with **GPA 3.68** / 4.00
- I am proud to have earned the distinction of being recognized as **an inspiring graduate**,
  a testament to my exceptional record of academic excellence and extracurricular accomplishments

CERTIFICATIONS

AWS	AWS Certified Solution Architect - Associate Credential ID: ECHZM6M1XEE4QDSB
Deeplearning.AI	Neural Network and Deep Learning Credential ID: D8GK6SD6Y5TG
Deeplearning.AI	Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization Credential ID: SGC98U3G8K6P

TECHNICAL SKILLS

Programming	Python, C++, Java, PHP, JavaScript, HTML, React, Golang, C, C#
Cloud	AWS Amazon Web Services, GCP Google Cloud Platform
ML Library	Scikit-Learn, PyTorch, TensorFlow, OpenCV
Database	MySQL, BigQuery, PostgreSQL, MongoDB

PUBLICATIONS

Muhammad Hilmi Asyrofi, Yang Zhou, Imam Nur Bani Yusuf, Hong Jin Kang, Ferdian Thung, and David Lo. "**BiasFinder: Metamorphic Test Generation to Uncover Bias for Sentiment Analysis Systems**". IEEE Transaction on Software Engineering (Q1, CCF Rank A, Impact Factor 9.32). PDF GitHub DOI

Zhou Yang, Jieke Shi, Muhammad Hilmi Asyrofi, and David Lo. "**Revisiting Neuron Coverage Metrics and Quality of Deep Neural Networks**". *28th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER)*. Honolulu, Hawai. March 2022. PDF GitHub DOI

Muhammad Hilmi Asyrofi, Zhou Yang, Jieke Shi, Chu Wei Quan, and David Lo. "**Can Differential Testing Improve Automatic Speech Recognition Systems?**". 37th IEEE International Conference on Software Maintenance and Evolution (ICSME). Luxembourg. September 2021. PDF GitHub DOI

Zhou Yang, Harshit Jain, Jieke Shi, Muhammad Hilmi Asyrofi, and David Lo. "**BiasHeal: On-the-Fly Black-Box Healing of Bias in Sentiment Analysis Systems**". 37th IEEE International Conference on Software Maintenance and Evolution (ICSME). Luxembourg. September 2021. PDF GitHub DOI

Muhammad Hilmi Asyrofi, Yang Zhou, and David Lo. "**CrossASR++: A Modular Differential Testing Framework for Automatic Speech Recognition**". *29th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE '21)*. Athens, Greece. August 2021. PDF GitHub Video DOI

Zhou Yang, Muhammad Hilmi Asyrofi, and David Lo. "**BiasRV: Uncovering Biased Sentiment Predictions at Runtime**". *29th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE '21)*. Athens, Greece. August 2021. PDF GitHub Video DOI

Muhammad Hilmi Asyrofi, Ferdian Thung, David Lo, and Lingxiao Jiang. "**CrossASR: Efficient Differential Testing of Automatic Speech Recognition via Text-To-Speech**". *36th IEEE International Conference on Software Maintenance and Evolution (ICSME)*. Adelaide, Australia. October 2020. PDF GitHub Video DOI

Muhammad Hilmi Asyrofi, Ferdian Thung, David Lo, and Lingxiao Jiang. "**AUSearch: Accurate API Usage Search in GitHub Repositories with Type Resolution**". *27th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER)*. Ontario, Canada. February 2020. PDF GitHub Video DOI

INTERPERSONAL SKILLS

2018	**Granted Scholarship** from Rumah Amal Salman ITB. This scholarship focused on **capacity building** to create future leaders**.** I was awarded as **top 10 awardees** of this scholarship
2017	Selected participants to take **leadership training** from Siam Cement Group (SCG). Designed by SCG Learning, the program aims to give participants **fundamental leadership concepts** and provide them opportunities to **practice the interpersonal skill** with other young leaders

I declare the details stated to be true and complete.
(This resume is updated on November 1st, 2023)