LAPORAN AKHIR

MAGANG & STUDI INDEPENDEN BERSERTIFIKAT

Machine Learning

Studi Independen

Di PT.Decoding Indonesia

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TEKNIK INFROMATIKA
UNIVERSITAS DARUSSALAM GONTOR
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Kata Pengantar

Dengan mengucapkan syukur ke hadirat Allah SWT, saya dapat menyelesaikan Laporan Akhir Magang & Studi Independen Bersertifikat (MSIB) yang diselenggarakan melalui Kampus Merdeka di PT Dicoding Akademi Indonesia.

Dalam pelaksanaan Studi Independen ini kami banyak mendapatkan bimbingan serta ilmu yang sangat bermanfaat yang berkaitan dengan advokat dari berbagai pihak, maka perkenankanlah kami untuk mengucapkan terimakasih kepada :

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Semoga budi baik mereka semua mendapatkan balasan, serta semoga kerja sama yang telah kita jalani tidak akan terhenti hanya sampai dengan berakhirnya masa kegiatan Studi Independen ini, tetapi akan terus berlanjut serta menjadi ikatan dalam menjaga persaudaraan yang telah kita jalin bersama.

Dalam hal pembuatan laporan ini, penulis masih merasa jauh dari kata sempurna, sehingga penulis memohon maaf atas kekurangan yang ada dalam penulisan laporan kegiatan Studi Independen ini, sekiranya jika ada kritik dan saran yang dapat membangun kesempurnaan dalam laporan ini. Semoga laporan ini dapat bermanfaat bagi semua pihak yang membacanya.

Ponorogo, 22 Desember 2024

Fauzan Afif Lutfiansah

Daftar Isi

Daftar Gambar

I. Gambaran Umum

A. Profil Perusahaan

Bangkit adalah program pelatihan karier yang dirancang oleh Google, GoTo, dan Traveloka untuk membantu mahasiswa Indonesia mempersiapkan diri memasuki dunia kerja di industri teknologi dengan keterampilan yang relevan. Diluncurkan pada tahun 2020 sebagai bagian dari Kampus Merdeka, program ini menawarkan tiga jalur pembelajaran utama, yaitu machine learning, mobile development, dan cloud computing. Selain fokus pada teknologi, Bangkit juga membekali peserta dengan kemampuan bahasa Inggris dan soft skills yang mendukung pengembangan karier. Peserta akan mendapatkan berbagai manfaat, seperti sertifikat global dari Google, pembelajaran dari kurikulum dan mentor berkualitas, konversi hingga 20 SKS, peluang karier eksklusif, dan dukungan hingga 140 juta rupiah untuk membangun startup. Program ini diselenggarakan oleh Universitas Indonesia sebagai mitra resmi dan terbuka untuk mahasiswa yang ingin mengembangkan potensi di salah satu bidang tersebut, dengan seluruh pelatihan yang diberikan secara gratis (Admin Kemahasiswaan, n.d.).

B. Deskripsi Kegiatan

Posisi : Machine Learning

Deskripsi : Web3 Selama mengikuti program Bangkit Academy pada jalur pembelajaran Machine Learning, saya menjalani pelatihan intensif yang mencakup berbagai aspek penting dalam bidang ini. Pelatihan diawali dengan mempelajari dasar-dasar machine learning, termasuk konsep algoritma supervised dan unsupervised learning. Selanjutnya, saya mendalami pengolahan data, di mana saya mempraktikkan proses pembersihan dan persiapan data menggunakan Python serta library seperti Pandas dan NumPy. Setelah itu, saya mempelajari pembangunan model machine learning dengan mengimplementasikan berbagai algoritma melalui tools seperti Scikit-Learn dan TensorFlow. Untuk menerapkan ilmu yang

telah diperoleh, saya terlibat dalam pengerjaan capstone project secara kolaboratif bersama tim yang terdiri dari berbagai disiplin ilmu. Program ini memberikan pemahaman yang komprehensif sekaligus pengalaman praktis dalam merancang solusi berbasis machine learning.

Kompetensi yang dikembangkan :

1. Pemrograman Python untuk Pengembangan Machine Learning
2. Problem-solving dan critical thinking
3. Kolaborasi dalam tim lintas disiplin ilmu
4. Kemampuan Analisis Data
5. Komunifasi dan kolaborasi yang baik dengan team

Tuliskan secara singkat hal apa yang telah dilakukan selama program :

Melakukan kegiatan social media marketing dengan metode Selama mengikuti program Bangkit Academy di jalur pembelajaran Machine Learning, saya mendapatkan pelatihan intensif yang mencakup berbagai aspek penting dalam pengembangan teknologi berbasis kecerdasan buatan. Saya mempelajari cara membangun model machine learning menggunakan arsitektur TensorFlow dan menerapkannya ke berbagai platform, termasuk web, Android, dan Google Cloud Platform. Selain itu, saya mendalami Generative AI untuk menciptakan solusi inovatif berbasis kecerdasan buatan, serta mempelajari Computer Vision untuk mengenali dan menganalisis gambar dengan lebih efektif. Saya juga mempelajari pembuatan dashboard berbasis web untuk analisis data, yang memungkinkan visualisasi data secara interaktif dan mempermudah pengambilan keputusan berbasis data.

Dalam pelatihan ini, saya berlatih membersihkan dan memproses data menggunakan Python dengan library seperti Pandas dan NumPy, serta mengembangkan model machine learning yang diimplementasikan melalui tools seperti Scikit-Learn dan TensorFlow. Selain itu, saya mempelajari teknik deployment model ke lingkungan produksi, sehingga solusi yang dikembangkan dapat langsung digunakan dalam skenario nyata. Sebagai bagian dari Capstone Project, saya bekerja sama dengan tim lintas disiplin ilmu untuk mengembangkan solusi nyata berbasis machine learning yang relevan dengan kebutuhan masyarakat. Pengalaman ini tidak hanya memperdalam pemahaman teknis saya, tetapi juga melatih keterampilan kolaborasi, komunikasi, dan pemecahan masalah kompleks yang sangat penting dalam dunia industri teknologi. Program ini memberikan kombinasi sempurna antara pembelajaran teori dan penerapan praktis, mempersiapkan saya untuk menghadapi tantangan di industri teknologi yang terus berkembang.

II.Aktivitas Bulanan

Pada Bagian ini berisi aktivitas bulanan yang dapat diambil dari laporan bulanan yang sudah dibuat di dalam platform dengan format sebagai berikut

Bulan	Kegiatan
1	During the Bangkit Batch 2 2024 Independent Study program, I participated in various activities that supported competency development, especially in the field of Machine Learning. Mentoring and coordination activities with the mentor and the DPP (Program Supervisor) were structured and intensive. Every week, we held regular meetings to discuss task progress, address challenges encountered, and receive valuable feedback from the mentor. Communication was carried out via digital platforms such as Google Meet and Discord, with the support of tools like Google Calendar to schedule activities efficiently. The tasks I completed included taking several courses on Coursera and Decoding, one of which was the "Crash Course in Python." In this course, I learned the basics of Python programming, from variables, functions, to advanced concepts such as loops and data processing. Additionally, I also completed the course "Using Python to Interact with the Operating System," which taught how to use Python to interact with the operating system, such as managing files and automating tasks. However, one of the biggest challenges I faced was when program activities clashed with other official events, both within the campus and external events. Nevertheless, I saw this as an opportunity to hone my time management and communication skills. I had to be smart in managing my schedule and

	coordinating with the relevant parties to reach mutually beneficial agreements. This experience helped me handle similar situations in the future. The competency development I gained during this program was very diverse. From a technical perspective, I gained a deeper understanding of Python programming and its applications, such as data cleaning and wrangling. I also experienced significant improvement in time management, effective communication, and creative problem-solving. All of these skills will be highly beneficial for my future career development.
2	Over the past month, the mentoring activities and coordination with my mentor and DPP have been incredibly valuable and inspiring. The mentor and DPP not only assisted in understanding complex learning materials but also provided continuous motivation and encouragement to stay productive amid the internship demands and other activities. They consistently emphasized the importance of completing each submission on time, which has been crucial in maintaining optimal learning progress. My primary focus this month was on the Machine Learning Specialization, covering key topics such as regression, classification, advanced learning algorithms, unsupervised learning, recommender systems, reinforcement learning, and deep learning using TensorFlow. Additionally, I delved into the Introduction to Convolutional Neural Networks (CNN). With a wide array of topics within machine learning, my understanding of the concepts and application of machine learning algorithms has deepened significantly, especially regarding TensorFlow usage.

	. The challenges I encountered were quite complex, as I am also actively involved in several campus organizations, including BEM and GenBI, and serve as a teaching assistant. Moreover, I am engaged in various research projects with faculty members under DIKTI, including the Student Creativity Program (PKM). Balancing these commitments made time management the primary challenge, particularly in ensuring each task was completed effectively and punctually. To address these challenges, I adopted an effective communication strategy and a well-organized schedule to avoid conflicts between activities. My main priority was to ensure that each responsibility was met according to its target without compromising the quality of work. In terms of competency development, I have experienced significant growth in my understanding and application of machine learning, particularly with TensorFlow. Previously, my knowledge in this area was limited to basic concepts learned through the Bangkit program. However, over the past month, I have managed to deepen my understanding by exploring more comprehensive concepts and practices. Additionally, my time management skills have improved, especially in prioritizing tasks and balancing academic, organizational, and research activities. Overall, this experience not only enhanced my technical skills but also strengthened essential managerial skills crucial for future career development. Through interactions with my mentor and DPP, I gained new perspectives on handling challenges and balancing multiple responsibilities. Moving forward, I hope to further deepen my knowledge in machine learning and optimize my task management skills to effectively and efficiently fulfill all responsibilities.
3	This month, I maintained good relationships with my mentor and the DPP team. Mentoring activities were conducted regularly

	through weekly virtual meetings. My mentor provided valuable guidance, particularly on developing machine learning models using TensorFlow and implementing them in Android applications. Communication was smooth, allowing me to discuss challenges and find solutions effectively. In terms of tasks and learning, I successfully completed several essential courses. These include the DeepLearning.AI TensorFlow Developer Professional Certificate for Natural Language Processing in TensorFlow and Sequences, Time Series, and Prediction I also completed parts of the TensorFlow: Data and Deployment Specialization , such as Browser-based Models with TF.js and Device-based Models with TF Lite . Additionally, Applied Machine Learning for Android Developer . My project focused on integrating machine learning models into Android applications, and it has shown significant progress so far. The biggest challenge I faced was managing my time amidst a very tight schedule. Besides this program, I am also actively involved in several campus organizations, holding key positions that demand considerable attention. Moreover, I am participating in a research project with faculty members on sentiment analysis using Machine Learning . These activities often require strict time management, as both research and organizational responsibilities cannot be delayed. To overcome this challenge, I created a more structured daily work schedule, prioritizing core tasks. I also adopted time management techniques like time-blocking to ensure each task received adequate attention. Furthermore, I began delegating more responsibilities in the organizations I am involved in, allowing me to focus on core tasks and maintain productivity across all areas. Throughout this process, I have noticed significant development in my competencies. I gained a deeper understanding of how machine learning models can be applied to mobile devices. My knowledge of project management also improved through the Structuring ML Project course. Additionally, my involvement in organizations and research has enhanced my team management skills and exploration of technology-based solutions, which are highly relevant for future

	professional needs.
4	This month, I successfully maintained good relationships with my mentor and the DPP team. Mentoring activities were conducted regularly through weekly virtual meetings. My mentor provided valuable guidance on completing the capstone project and managing the team. Communication went smoothly, enabling me to discuss challenges and find effective solutions. In terms of tasks and learning, I successfully completed the TensorFlow: Advanced Techniques Specialization, which includes Advanced Computer Vision with TensorFlow, Generative AI for Everyone, and Generative Adversarial Networks (GANs), such as Build Basic Generative Adversarial Networks (GANs) and Wasserstein GANs with Gradient Penalty. Additionally, I also completed the Capstone Project in the Bangkit program as an ML Engineer. My project focused on integrating machine learning models into Android applications, which has shown significant progress so far. The biggest challenge I faced was managing time amidst a very tight schedule. Apart from this program, I am also actively involved in several campus organizations, holding strategic positions that demand significant attention. Moreover, I am participating in a research project with faculty members on sentiment analysis using machine learning. These activities often require strict time management since neither research nor organizational responsibilities can be postponed. To overcome this challenge, I created a more structured daily schedule by prioritizing core tasks. I also adopted time management techniques such as time-blocking to ensure each task received sufficient attention. Furthermore, I began delegating more responsibilities in the organizations I am part of, allowing me to focus on core tasks and maintain productivity in all areas. Through this process, I have noticed significant development in my competencies. I gained a deeper understanding of how machine learning models can be applied to mobile devices. My knowledge of project management also improved through the Structuring ML

	Project course. Additionally, my involvement in organizations and research has enhanced my team management skills and exploration of technology-based solutions, which are highly relevant for future professional needs.

III.Penutup

A. Kesimpulan

Melalui program Studi Independen di PT Dicoding Akademi Indonesia dalam learning path Machine Learning, saya berhasil mencapai beberapa pencapaian penting, antara lain:

1. Pemahaman Dasar dan Penerapan Machine Learning Saya memahami konsep dasar algoritma machine learning, baik supervised maupun unsupervised, yang dapat diterapkan pada berbagai masalah nyata.
2. Pengembangan Keterampilan Pemrograman Python dan Analisis Data Program ini mengasah keterampilan saya dalam pemrograman Python, khususnya dalam pengolahan data dengan Pandas dan NumPy, serta membangun model menggunakan Scikit-Learn dan TensorFlow
3. Pengalaman Kolaborasi dalam Capstone Project mengintegrasikan model Saya bekerja dalam tim lintas disiplin untuk mengerjakan proyek Capstone, yang memberikan pengalaman berharga dalam penerapan keterampilan teknis dan soft skills.

B. Saran

Berdasarkan pengalaman saya mengikuti program MSIB di PT Dicoding Akademi Indonesia, ada beberapa hal yang dapat diperbaiki, yaitu:

1. Saran untuk Kampus Merdeka: Berikan alur pendaftaran yang pasti tidak seperti kemarin terjadi pengunduran hasil pengumuman.
2. Saran untuk Bangkit (Mitra): Untuk Mechine Learning path di harapkan dapat mendapatkan sertifikasi TensorFlow karena sudah tanggu sekali mempelajari tidak di lanjut dengan sertifikasi TensorFlow

Referensi

[1] *https://kampusmerdeka.kemdikbud.go.id/*

[2] Admin Kemahasiswaan. n.d. "Program Bangkit Direktorat Jendal Pendidikan Tinggi." https://kemahasiswaan.ui.ac.id/program-bangkit-direktorat-jenderal-pendidikan-tinggi/

[3] *https://www.dicoding.com/programs/bangkit/*

Lampiran

Beberapa Sertifikat :

Gambar 1.1

Gambar 1.2

Gambar 1.3

Gambar 1.4

Gambar 1.5

Gambar 1.6

Gamba 1. 7

Gambar 1.8

Gambar 1.9

Gambar 1.10

Gambar 1.11

Gambar 1.12

Gamar 1.12

Gambar 1.13

Capstone Project :

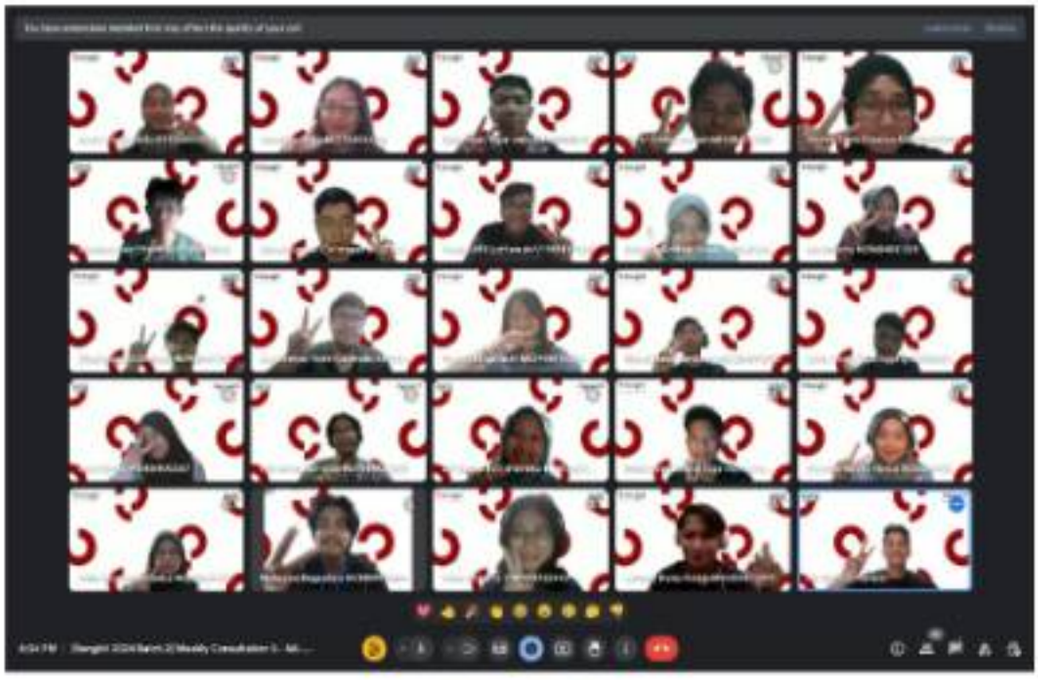
Gambar 2.1

Gambar 2.2

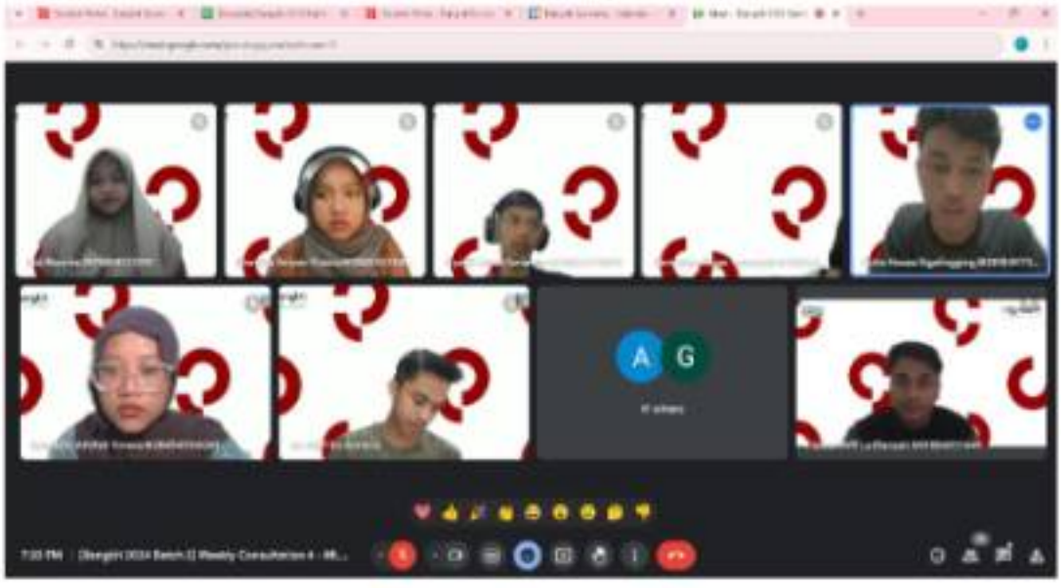
Gambar 2.3

Gambar 2.4

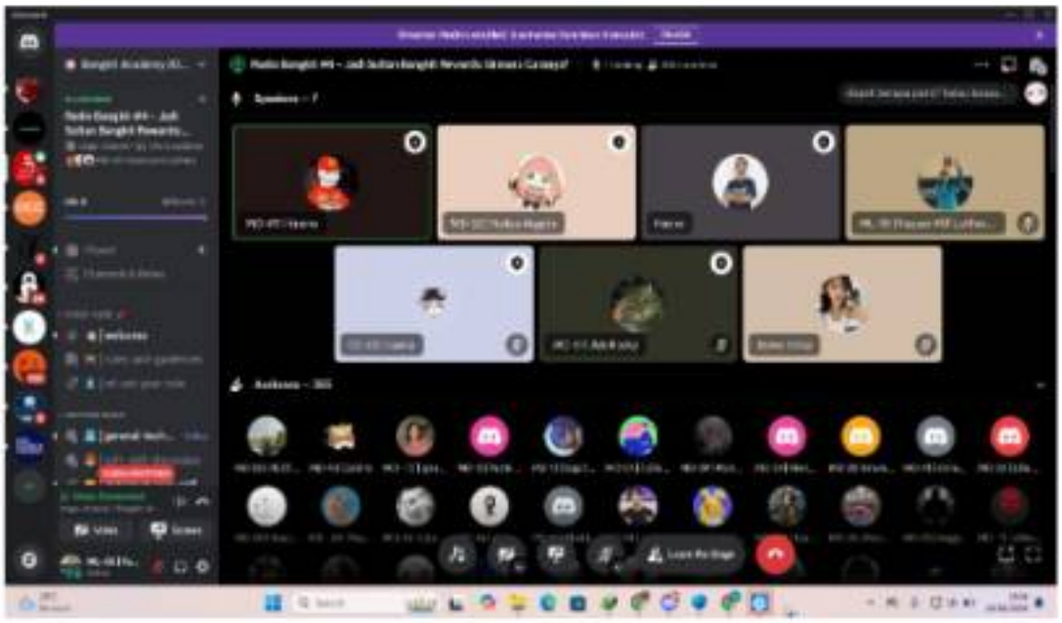
Sesi ILT dan Kumpul :



Gambar 3.1



Gambar 3.2



Gambar 3.4

Gambar 3.3

Gambar 3.6