PENGEMBANGAN PROTOTIPE SISTEM DETEKSI RINTANGAN BAGI PENYANDANG DISABILITAS NETRA

SKRIPSI

Diajukan untuk Memenuhi Sebagai Syarat Memperoleh Gelar Sarjana Pendidikan
Teknik Elektro Konsentrasi Elektronika Industri

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UNIVERSITAS PENDIDIKAN INDONESIA
BANDUNG
2024

HALAMAN HAK CIPTA

PENGEMBANGAN PROTOTIPE SISTEM DETEKSI RINTANGAN BAGI PENYANDANG DISABILITAS NETRA

Oleh:

Krisna Dwi Nurikhsani

Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Pendidikan pada fakultas Pendidikan Teknologi dan Kejuruan
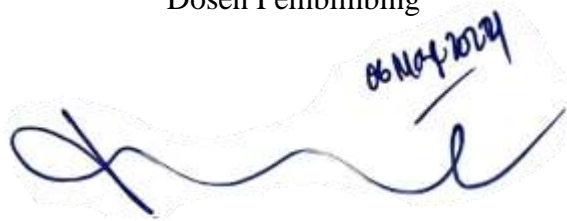
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Dengan ini saya menyatakan bahwa skripsi dengan judul "Pengembangan Prototipe Sistem Deteksi Rintangan bagi Penyandang Disabilitas Netra" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan maupun pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 5 Juni 2024
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UCAPAN TERIMA KASIH

Segala puji bagi Allah SWT karena berkat rahmat dan karunia-Nya penulis dapat menyelesaikan Skripsi dengan judul "Pengembangan Prototipe Sistem Deteksi Rintangan bagi Penyandang Disabilitas Netra" yang mana menjadi salah satu syarat untuk memperoleh gelar Sarjana di Program Studi Pendidikan Teknik Elektro konsentrasi Elektronika Industri. Dalam proses penyusunannya, penulis telah melalui banyak sekali lika-liku rintangan dan hambatan baik itu secara internal maupun eksternal. Namun berkat do'a, dukungan, dan motivasi yang penulis dapatkan, membuat penulis telah sampai hingga akhir dari perjalanan yang panjang. Dengan kerendahan hati penulis ucapkan Alhamdulillahi Rabbil 'Alamin dan terima kasih kepada:

1. Seluruh keluarga besar, khususnya kedua orang tua, Ibu Nining, Ayah Iksana, Kakak Indah, dan Adik Syifa.
2. Bapak Prof. Dr. Ade Gafar Abdullah, M.Si selaku dosen pembimbing yang telah memberikan arahan dan dukungan selama proses pengerjaan skripsi.
3. Bapak Dr. Ir. Maman Somantri S.Pd., M.T. IPM selaku Ketua Program Studi Pendidikan Teknik Elektro, FPTK UPI.
4. Bapak Dr. Tasma Sucita, S.T., M.T. selaku Ketua Kelompok Bidang Keahlian Pendidikan Teknik Elektro, FPTK UPI.
5. Bapak Wawan Purnama, S.Pd., M.Si. selaku dosen wali penulis yang telah memberikan banyak bimbingan dan informasi dalam hal akademik selama masa perkuliahan.
6. Seluruh dosen dan staf di Universitas Pendidikan Indonesia khususnya seluruh jajaran dosen Pendidikan Teknik Elektro FPTK UPI yang telah memberikan ilmu kepada penulis selama perkuliahan sampai penulis dapat menyelesaikan studi.
7. Teman seperjuangan Diki dan Irgi (DKI), yang senantiasa memberikan dukungan dan motivasi untuk tetap konsisten.

8. Teman-teman mahasiswa seperjuangan kelas PTE-B 2020, kelas Konsentrasi Elektronika Industri, dan kelas Teknik Elektro 02 khususnya kontrakan mahasiswa-mahasiswa kuat.

9. Rekan-rekan tim IoT-Terrarium yang telah memberikan pengalaman tak terlupakan selama mengikuti PKM tahun 2021 sampai lolos pendanaan.

10. Kekasihku Sella Rosyana, yang senantiasa memberikan inspirasi, dorongan, dan dukungan di setiap perjalanan ini dengan ikhlas dan penuh kesabaran.

11. Rekan-rekan tim Echo Sense yang telah memberikan inspirasi kepada penulis untuk meneliti tentang Visi Komputer pada kegiatan PKM 2023.

12. Rekan-rekan Gaffar *Clustered* yang banyak membantu memberi masukan dalam hal penulisan.

13. Semua pihak yang telah membantu dalam penelitian ini yang tidak bisa penulis sebutkan satu per satu.

Semoga Allah SWT membalas atas semua kebaikan pihak yang telah membantu penulis hingga terselesaikannya skripsi ini. Mohon maaf apabila ada kesalahan ataupun kekeliruan penulis baik yang disengaja maupun yang tidak disengaja. Penulis menyadari, laporan yang disusun masih jauh dari kesempurnaan, baik dari materi maupun teknik penyajiannya. Oleh karena itu, kritik dan saran yang membangun sangat diharapkan agar kedepannya dapat lebih baik lagi. Dan semoga skripsi ini dapat bermanfaat khususnya bagi penulis dan bagi pembaca umumnya.

Bandung, Juni 2024

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ABSTRAK

PENGEMBANGAN PROTOTIPE SISTEM DETEKSI RINTANGAN BAGI PENYANDANG DISABILITAS NETRA

Oleh:

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Penelitian ini bertujuan untuk mengembangkan prototipe sistem deteksi rintangan yang intuitif untuk penyandang disabilitas netra, menggunakan teknologi terbaru seperti raspberry pi dan kamera penglihatan malam. Melalui studi literatur, pengadaan alat dan bahan yang sesuai, serta pembuatan dan pelatihan *dataset* menggunakan TensorFlow Lite, sistem ini dirancang untuk meningkatkan mobilitas dan kemandirian penyandang disabilitas netra. Hasil penelitian menunjukkan bahwa model SSD MobileNet v2 FPNLite yang dikuantisasi menjadi pilihan terbaik, menawarkan keseimbangan antara kecepatan, akurasi, dan efisiensi memori. Implementasi sistem ini diharapkan dapat memungkinkan penyandang disabilitas netra untuk bergerak dengan lebih aman dan mandiri dalam berbagai kondisi lingkungan. Rekomendasi untuk pengujian lapangan dan penelitian lebih lanjut disarankan untuk memastikan efektivitas sistem di dunia nyata dan untuk meningkatkan performa sistem.

Kata Kunci: Deteksi Rintangan, Penyandang Disabilitas Netra, Raspberry Pi, Kamera Penglihatan Malam, TensorFlow Lite.

ABSTRACT

DEVELOPMENT OF AN OBSTACLE DETECTION SYSTEM PROTOTYPE FOR THE VISUALLY IMPAIRED

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This study aims to develop an intuitive obstacle detection system prototype for visually impaired individuals, utilizing cutting-edge technology such as the Raspberry Pi 4B and night vision cameras. Through literature review, appropriate equipment and material procurement, and the creation and training of a dataset using TensorFlow Lite, this system is designed to enhance the mobility and independence of the visually impaired. The findings indicate that the quantized SSD MobileNet v2 FPNLite model is the optimal choice, offering a balance between speed, accuracy, and memory efficiency. The implementation of this system is expected to enable visually impaired individuals to navigate more safely and independently across various environmental conditions. Recommendations for field testing and further research are suggested to ensure the system's real-world effectiveness and to improve system performance.

Keywords: *Obstacle Detection, Visually Impaired, Raspberry Pi, Night Vision Camera, TensorFlow Lite.*

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