SORTING MACHINE BERBASIS GAMBAR SEBAGAI TRAINING KIT PEMBELAJARAN JST PADA MATA KULIAH PRAKTIK SISTEM KENDALI CERDAS DI JURUSAN PTEI FT UNY

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ABSTRAK

Perkembangan teknologi saat ini sudah mengenal kecerdasan buatan (*Artificial Intelligence*/ AI) yang diaplikasikan diberbagai bidang. Perkembangan AI perlu disisipkan dalam pendidikan yang memberikan wawasan kepada mahasiswa mengenai teknologi AI, manfaat dan pengaplikasinya. Melalui mata kuliah praktik Sistem Kendali Cerdas di Jurusan Pendidikan Teknik Elektronika & Informatika FT UNY diperlukannya sebuah media pembelajaran yang terintegrasi antara *software* dan *hardware* agar kualitas pembelajaran sesuai dengan tuntutan dunia Industri. Penelitian ini bertujuan merealisasikan rancang bangun, mengetahui unjuk kerja, dan mengetahui tingkat kelayakan Trainer Pembelajaran Berbasis JST untuk Mengidentifikasi *Image* Pada Mata Kuliah Sistem Kendali Cerdas di Jurusan PTEI FT UNY dilengkapi dengan *Labsheet*.

Metode penelitian menggunakan *Research and Development* untuk menghasilkan produk media pembelajaran dan menguji keefektifan produk, dengan 9 tahapan prosedur pengembangan meliputi: (1) potensi dan masalah pembelajaran Jaringan Syaraf Tiruan, (2) pengumpulan data, (3) desain produk dimulai dengan perancangan cara kerja, penggunaan *software*, pengempilasikan pada *hardware*, (4) validasi desain, (5) revisi desain, (6) ujicoba produk, (7) revisi produk, (8) ujicoba pemakaian, dan (9) revisi produk. Objek penelitian adalah Training Kit Pembelajaran Jaringan Syaraf Tiruan. Teknik pengumpulan data meliputi pengamatan dan wawancara dan teknik analisis data dengan deskriptif kualitatif.

Hasil penelitian diketahui bahwa: (1) Training Kit Pembelajaran Jaringan Syaraf Tiruan terdiri dari *Software*, *Hardware* dan *labsheet* dilengkapi dengan Buku Panduan. Bagian *Software* terdiri *Image Processing*, *Building* JST, *Training* & *testing* JST dan Arduino *connection*. Bagian *Hardware* menggunakan Arduino UNO sebagai pengontrol dan terdiri dari Kamera web, *Push Button, Obstacle* Sensor, LCD 16x2, Motor Konveyor, dan Motor Servo. *Labsheet* sebagai petunjuk tugas. Training Kit Pembelajaran Jaringan Syaraf Tiruan juga dilengkapi dengan buku panduan untuk memudahkan dalam penggunaan; (2) Unjuk kerja trainer pembelajaran sudah berfungsi dengan stabil baik pada setiap bagian maupun secara keseluruhan dengan presentase sebesar 2.50%. (3) Tingkat kelayakan media dan materi memperoleh nilai 97.5% dan 81.25% termasuk dalam kategori sangat layak. Tingkat kelayakan pemakaian berdasarkan uji pemakaian kepada 20 mahasiswa diperoleh nilai 81.88% termasuk dalam kategori sangat layak. Hal ini berarti media pembelajaran ini sangat layak digunakan pada mata kuliah praktik Sistem Kendali Cerdas.

Kata kunci: Jaringan Syaraf Tiruan, Arduino UNO, *Software, Hardware,* Training Kit Pembelajaran, Praktik Sistem Kendali Cerdas

SORTING MACHINE BASED ON IMAGES AS A TRAINING OF KIT FOR ARTIFICIAL NEURAL NETWORK LEARNING IN THE PRACTICES OF INTELLIGENT CONTROL SYSTEMS IN THE DEPARTMENT OF PTEI FT UNY

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ABSTRACT

Current technological developments are familiar with artificial intelligence (AI) which is applied in various fields. The development of AI needs to be inserted in education that provides insight to students regarding AI technology, its benefits and application. Through the course of the Smart Control System practice in the Department of Electronics & Informatics Engineering Education FT UNY, we need an integrated learning media between software and hardware so that the quality of learning is in accordance with the demands of the industrial world. This study aims to realize the design, know the performance, and determine the feasibility level of ANN-Based Learning Trainer to Identify the Image in the Intelligent Control System Course in the Department of PTEI FT UNY equipped with Labsheet.

The research method uses Research and Development to produce learning media products and test the effectiveness of the product, with 9 stages of development procedures including: (1) potential and learning problems of Artificial Neural Networks, (2) data collection, (3) product design begins with designing work methods , the use of software, hardware depletion, (4) design validation, (5) design revision, (6) product testing, (7) product revision, (8) usage testing, and (9) product revision. The object of the research is the Artificial Neural Network Learning Training Kit. Data collection techniques include observations and interviews and data analysis techniques with qualitative descriptive.

The results of the study revealed that: (1) Artificial Neural Networks Learning Kit Training consists of Software, Hardware and Labsheets equipped with a Guidebook. The Software section consists of Image Processing, Building ANN, Training & testing ANN and Arduino connections. The Hardware section uses Arduino UNO as a controller and consists of a web camera, Push Button, Obstacle Sensor, 16x2 LCD, Motor Conveyor, and Servo Motor. Labsheets as task instructions. Artificial Neural Network Learning Kit Training is also equipped with a guidebook to facilitate use; (2) The performance of learning trainers has functioned stably both in each part and as a whole with a percentage of 2.50%. (3) The level of feasibility of the media and material obtained the value of 97.5% and 81.25% included in the very feasible category. The level of feasibility of use based on usage tests for 20 students obtained 81.88% included in the very feasible category. This means that this learning media is very suitable for use in the Smart Control System practice course.

Keywords*: Artificial Neural Networks, Arduino UNO, Software, Hardware, Learning Kit Training, Smart Control System Practice*