

**IMPLEMENTASI ALGORITMA K-NEAREST NEIGHBOUR (KNN)
UNTUK MENGLASIFIKASIKAN MINAT SISWA KELAS VIII
DALAM UPAYA PENENTUAN TIM OSN
DI SMP NEGERI 2 RENDANG**

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ABSTRAK

Penelitian ini bertujuan mengembangkan aplikasi desktop luring menggunakan algoritma K-Nearest Neighbour (KNN) sebagai solusi atas masalah objektivitas dan efisiensi pada proses seleksi awal kandidat Olimpiade Sains Nasional (OSN) di SMP Negeri 2 Rendang. Hal tersebut dilatarbelakangi oleh metode penyeleksian konvensional yang masih bersifat manual, rentan terhadap bias subjektivitas, dan belum mengoptimalkan data riwayat akademik siswa secara berkelanjutan. Untuk menghasilkan sistem pendukung keputusan yang akurat, sistem ini melakukan klasifikasi peminatan akademik melalui integrasi 12 fitur kuantitatif, mencakup akumulasi nilai rapor selama tiga semester untuk mata pelajaran IPA, IPS, dan Matematika, ditambah dengan rekam jejak prestasi kejuaraan. Secara metodologis, studi *Research and Development* (R&D) ini menerapkan pendekatan ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). Pengembangan aplikasinya memanfaatkan bahasa pemrograman Python dalam lingkungan komputasi luring, dikombinasikan dengan pustaka Scikit-Learn untuk pemrosesan inferensi dan CustomTkinter untuk perancangan antarmuka grafis pengguna. Pada penelitian ini, validasi keandalan algoritma dilakukan menggunakan metode pengujian K-Fold Cross Validation ($k=3$). Hasilnya menunjukkan bahwa konfigurasi tetangga terdekat pada nilai $k=5$ menghasilkan kinerja yang sangat optimal, mencatatkan tingkat akurasi sebesar 94,94%, presisi 95,61%, sensitivitas (recall) 94,94%, dan F1-Score sebesar 94,85%. Selanjutnya, pengujian fungsionalitas dan efektivitas aplikasi melalui metode *Blackbox* serta *User Acceptance Testing* (UAT) yang melibatkan 12 orang guru pembina OSN menghasilkan nilai kelayakan akumulatif mencapai 96,11%, yang berada pada kategori "Sangat Layak". Berdasarkan pencapaian metrik komputasi dan penerimaan positif dari para pengguna tersebut, aplikasi ini terbukti sangat layak dan efektif untuk diterapkan sebagai instrumen penyaringan awal yang transparan, objektif, serta murni berlandaskan data.

Kata Kunci : ADDIE, Aplikasi Desktop, Klasifikasi Minat, K-Nearest Neighbour, Olimpiade Sains Nasional.

**IMPLEMENTATION OF THE K-NEAREST NEIGHBOUR (KNN)
ALGORITHM TO CLASSIFY THE INTERESTS OF EIGHTH-GRADE
STUDENTS IN AN EFFORT TO DETERMINE THE OSN TEAM AT SMP
NEGERI 2 RENDANG**

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ABSTRACT

This research aims to develop an offline desktop application using the K-Nearest Neighbour (KNN) algorithm as a solution to the problem of objectivity and efficiency in the initial selection process of National Science Olympiad (OSN) candidates at SMP Negeri 2 Rendang. This is motivated by conventional selection methods that are still manual, prone to subjectivity bias, and have not continuously optimized students' academic history data. To produce an accurate decision support system, this system classifies academic specialization through the integration of 12 quantitative features, including the accumulation of report card grades over three semesters for Science, Social Studies, and Mathematics subjects, coupled with a track record of championship achievements. Methodologically, this Research and Development (R&D) study applies the ADDIE (Analysis, Design, Development, Implementation, Evaluation) approach. The application development utilizes the Python programming language in an offline computing environment, combined with the Scikit-Learn library for inference processing and CustomTkinter for graphical user interface design. In this study, the reliability validation of the algorithm is carried out using the K-Fold Cross Validation ($k=3$) testing method. The results show that the nearest neighbor configuration at the value of $k=5$ produces highly optimal performance, recording an accuracy rate of 94.94%, precision of 95.61%, sensitivity (recall) of 94.94%, and an F1-Score of 94.85%. Furthermore, the functionality and effectiveness testing of the application through the Blackbox method and User Acceptance Testing (UAT) involving 12 OSN supervising teachers resulted in an accumulative feasibility score reaching 96.11%, which falls into the "Highly Feasible" category. Based on the achievement of computational metrics and positive acceptance from these users, this application is proven to be highly feasible and effective to be implemented as an initial screening instrument that is transparent, objective, and purely data-driven.

Keywords : *ADDIE, Desktop Application, Interest Classification, K-Nearest Neighbour, National Science Olympiad.*