

**RANCANG BANGUN PENDETEKSI JATUH  
PADA LANSIA MENGGUNAKAN *COMPLEMENTARY*  
*FILTER* DAN FUZZY SUGENO**

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**ABSTRAK**

Penelitian ini mengembangkan sistem deteksi jatuh berbasis logika Fuzzy Sugeno dengan input sudut pitch dan roll yang diperoleh dari sensor MPU6050. Sudut pitch dan roll dihitung menggunakan *complementary filter*, kemudian digunakan sebagai input ke dalam sistem fuzzy dengan lima fungsi keanggotaan dan 25 aturan. Tujuh aktivitas lansia dianalisis dan dikategorikan menjadi dua: ADL (*Activities of Daily Living*) dan FALL. Uji sistem terhadap data acuan menghasilkan akurasi sebesar 98.57% dan diuji kembali saat pengumpulan data menghasilkan akurasi 100% terhadap dua subjek. Sistem juga terintegrasi dengan Telegram sebagai media notifikasi kejadian jatuh. Hasil ini menunjukkan bahwa pendekatan Fuzzy Sugeno efektif dalam deteksi jatuh untuk lansia dan dapat dijadikan dasar pengembangan lebih lanjut dalam sistem monitoring berbasis IoT.

**Kata Kunci:** Fuzzy Sugeno, *Complementary Filter*, Sistem Deteksi Jatuh, MPU6050, *Internet of Things*

# ***FALL DETECTION SYSTEM FOR ELDERLY PEOPLE USING COMPLEMENTARY FILTER AND FUZZY SUGENO***

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## ***ABSTRACT***

*This research focuses on a fall detection system utilizing Fuzzy Sugeno logic, based on pitch and roll angles derived from the MPU6050 sensor. The pitch and roll angles were calculated using a complementary filter and used as inputs for the fuzzy system, which consisted of 5 membership functions and 25 rules. Seven elderly activities were analyzed and categorized into ADL (Activities of Daily Living) and FALL. Testing on reference data yielded an accuracy of 98.57%, and further testing on two subjects during data collection achieved 100% accuracy. The system was also integrated with Telegram for fall notifications. The results confirm that Fuzzy Sugeno is effective for elderly fall detection and can serve as a foundation for further development of IoT-based health monitoring systems in microcontrollers.*

**Keywords:** Fuzzy Sugeno, Complementary Filter, Fall Detection System, MPU6050, Internet of Things