

ABSTRAK

Media pembelajaran konvensional dinilai kurang mampu mempertahankan fokus dan keterlibatan anak dengan Autism Spectrum Disorder (ASD), sementara ketidakstabilan visual pada media digital (*drift, jitter, floating*) berpotensi memicu frustrasi hingga *tantrum*. Penelitian ini menerapkan algoritma FAST Corner Detection sebagai modul pengukuran independen yang berjalan berdampingan dengan Plane Finder Vuforia pada aplikasi pembelajaran Augmented Reality *markerless* berbasis Unity, guna mengevaluasi hubungan antara kepadatan fitur visual (*corner count*) dan stabilitas penempatan objek virtual. Pengembangan dilakukan menggunakan metode Multimedia Development Life Cycle (MDLC), dengan pengujian pada 24 sesi mencakup kondisi pencahayaan siang, sore, dan malam. Hasil uji Mann-Whitney U menunjukkan reduksi *drift* signifikan sebesar 72,57–100% dan *floating* sebesar 89,96–100% pada mode FAST dibandingkan Baseline, sedangkan parameter *jitter* tidak menunjukkan perbedaan signifikan karena lebih dipengaruhi oleh sensor perangkat dibandingkan kepadatan fitur visual. Evaluasi penerimaan pengguna (UAT) terhadap terapis ASD menghasilkan skor 4,94 dari 5,00 (98,75%), dengan kategori Sangat Layak. Penelitian ini memberikan landasan empiris bahwa kepadatan fitur visual berasosiasi dengan stabilitas *tracking markerless* AR, meskipun arsitektur sistem tidak melibatkan umpan balik langsung antara kedua modul.

Kata Kunci: Augmented Reality, Autism Spectrum Disorder, FAST Corner Detection, Plane Finder, Stabilitas *Tracking*.

ABSTRACT

Conventional learning media are considered insufficient in sustaining the attention and engagement of children with Autism Spectrum Disorder (ASD), while visual instability in digital media (drift, jitter, floating) may trigger frustration or tantrums. This study applies the FAST Corner Detection algorithm as an independent measurement module running alongside Vuforia's Plane Finder within a Unity-based markerless Augmented Reality learning application, to evaluate the relationship between visual feature density (corner count) and virtual object placement stability. Development was conducted using the Multimedia Development Life Cycle (MDLC) method, with testing across 24 sessions covering daytime, afternoon, and nighttime lighting conditions. Mann-Whitney U test results show a significant drift reduction of 72.57–100% and floating reduction of 89.96–100% in FAST mode compared to Baseline, while jitter showed no significant difference, being more influenced by device sensors than visual feature density. User Acceptance Testing (UAT) conducted with an ASD therapist yielded a score of 4.94 out of 5.00 (98.75%), categorized as Highly Feasible. This research provides empirical grounding that visual feature density is associated with markerless AR tracking stability, despite the system architecture not involving direct feedback between the two modules.

Keywords: Augmented Reality, Autism Spectrum Disorder, FAST Corner Detection, Plane Finder, Tracking Stability.