



Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Perceptions Across Generations: Analyzing Age-Related Differences in Distinguishing Between AI-Generated and Real Facial Stimuli

Finalist's Name: Ella Blakeley

School and City: Palmer Ridge High School, Monument

Sponsor's Name: Stephanie Markle

Category: Behavioral & Social Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Since 2019, deepfake content has risen by 550%, driven by realistic AI technology. The N170 event-related potential (ERP) is linked to facial processing and may be sensitive to facial animacy, refining as the brain develops. Studies also suggest that while stimuli may be neurologically categorized correctly, behavioral responses may not align. However, no prior studies have compared different age groups' neurological categorization of AI vs. real faces or tested their neurobehavioral disconnect.

This study used an electroencephalogram machine (EEG) to record participant's neurological responses as they viewed a video alternating between real and AI-generated faces. A behavioral test then assessed their ability to categorize images as being real or AI-generated. EEG results were analyzed for amplitude and latency, while behavioral accuracy was compared across age groups.

Initial findings suggest adults struggle to distinguish AI from reality, whereas young adults can do so effectively, both with a strong neurobehavioral connection. However, an analysis of variance showed no statistical significance in these differences, indicating a need for a larger sample size and suggesting humans may not be able to detect AI from reality reliably. This raises many flags for concern regarding the use, abuse, and regulation of AI in our modern world.

This research has important criminal justice implications. Understanding the N170 response could improve deepfake detection, aiding law enforcement in preventing misinformation and digital fraud. Better AI identification methods can help protect citizens, the economy, and national security.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**