

## OFFICIAL ABSTRACT and CERTIFICATION

### Novel Smart Algorithms used to Assist and Encourage STEM Group Participation among members with Autism Spectrum Disorders

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The population of people with autism spectrum disorders (ASD) has been continuously increasing. Only 16% of autistic adults are currently full-time employed, as compared to 47% of people with other disabilities. People with ASD have fewer career chances, in spite of 77% of them wanting to work. While autistic adults show high levels of interest in STEM activities, they continue to be marginalized in such careers. It has been argued that persons with ASD experience serious difficulties with social interactions, due to their arguably less developed emotional intelligence (EI). EI is the ability to recognize and express emotions in social environments. Since many STEM activities are team-oriented, and team members require emotion recognition and tracking skills, this research project devised novel computer algorithms to improve the participation of persons having an ASD and wishing to participate in team activities. The feedback through the algorithms compensates for difficulties people with ASD have in understanding social and emotional cues during teamwork. This proposed technology can also use machine learning to create aids, like questions about aspects of the idea discussed by a team or use emotionally-laden words and scripted phrases to reinforce language skills if the person with the ASD does not participate or if there is a dissonance between his/her emotions and those of the team. Using the algorithms in ASD therapy is expected to identify a more effective set of neurobiological patterns, thus hopefully leading to more potent and cost-effective therapies.

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