

# AI-Guided Prediction and Control of High-School Dropouts

Sophia Lin<sup>1,2</sup>, Houlong Zhuang<sup>2</sup>

<sup>1</sup>Basis Scottsdale, Arizona, USA.

<sup>2</sup>Arizona State University, Arizona, USA

## Abstract

School dropout permeates various teaching modalities and has generated social, economic, political, and academic damage to those involved in the educational process. Each high school dropout costs the United States economy \$272,000 due to lower tax contributions, higher reliance on Medicaid and Medicare, higher rates of criminal activity, and higher reliance on welfare. While the national status dropout rate has been slowly decreasing in the past 20 years, it is still alarmingly above 5% in 2022. In this study, we deploy state-of-the-art artificial intelligence (AI) models, specifically Long Short-Term Memory (LSTM) networks, to predict student dropouts and identify correlated significant predictors. Our analysis shows that students of color (by race), students with disabilities (by disability status), male students (by sex), students in low-income household (by household income), institutionalized students (by living quarters), students spoke language other than English at home (by English speaking ability), and students born outside of US (by immigration status) are more likely to drop out. Furthermore, our model prediction demonstrates that high-school dropouts, decreasing not fast enough, will continue to be a challenging social & educational issue in the foreseeable future. Based on our findings, we then discussed how corresponding intervention programs and education policy choices need to be designed or adjusted nationwide to improve the high-school graduation rate more efficiently. Those actions include, but do not limit to, reaching out to the areas at high risk, planning government budgets based on predicted student dropouts, and increasing awareness of dropout prevention resources for families and educators. Our approach aims to harness the full potential of AI in addressing critical challenges within education and then providing data-driven insights and interventions.

**Keywords:** artificial intelligence; dropout interventions; education policy; long short-term memory networks; school dropout