

Design and Construction of a Rube Goldberg Clock
(Technical Report)

The Controversial Place of Telehealth in Mental Healthcare in the United States
(STS Research Paper)

An Undergraduate Thesis Portfolio
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by

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Preface

Like physiological health, mental health is best pursued through both prevention and treatment. Psychological stresses can have undesirable mental health effects, but such stresses are often defended as the necessary price of achievement. Innovative techniques, however, can sometimes promote achievement in ways that can prevent undue stress. For example, many students may find hands-on projects both less stressful and more effective than lectures, textbooks, problem sets, and tests. Such opportunities may thereby prevent the mental health effects of excessive stress. Once mental health has been compromised, however, effective treatment is necessary. Telemental health services can extend the reach and improve the accessibility of mental healthcare, yet the efficacy of such techniques is controversial.

To apply students' skills in computer-aided design (CAD), rapid prototyping with laser cutting and 3D printing, and project management, the project team designed and constructed a clock incorporating mechanisms inspired by Rube Goldberg's designs. The design project exercised students' expertise in mechanical design, electrical engineering, and microcontroller programming. The team incorporated an updated Ferrofluid Clock, an unfinished technical project from 2019, as the primary mechanism for displaying time.

Telehealth services now include remote mental healthcare services. Such telemental health techniques extend the reach and accessibility of mental healthcare, but their efficacy is controversial. Mental health professionals, patients, and digital health companies disagree about the desirable extent and application of telemental healthcare services. Critics of telemental healthcare services argue that such services inevitably substitute for the direct professional care that patients urgently need, thereby compromising patients' safety. Proponents of telemental health, however, argue that such services are necessary both as supplements to direct professional care and to reach people who would otherwise go untreated.