

## Executive Summary

Personal safety has immensely increased over the last couple of years. Inspired by the vision of the Asian Defense Alliance in New York City, our team developed BraceForce, a discreet self-defense bracelet that is designed to empower users from all walks of life with the confidence to feel safe in their lives.

The goal of this project, as a part of the Northwestern University Design Thinking and Communication Program, was to develop a self-defense tool that fills a void in the current market, prioritizing social and legal accessibility, comfort, and efficacy. Our design aligns with the United Nations Sustainable Development Goal 16: Peace, Justice, and Strong Institutions, through minimizing violence and promoting safety in vulnerable populations.

To tailor our design, we conducted a digital survey that received over 100 responses, with individuals ranging from 18 to upwards of 60 years old. Over 80% reported low confidence in self-defense, and 71% felt unsafe when walking alone. From these, we developed user requirements derived from convenience, durability, adjustability, safety, and usability. We then went through mockup iterations and performed testing until we reached our final prototype.

BraceForce is a bracelet that wraps around the user's wrist during daily activities and can be deployed as a defensive flail and deterrent in emergencies. The tool consists of a nylon paracord strap with an attached steel weight that is housed in a 3D-printed sleeve and connected via magnetic force. A sliding bead and ziptie system allows for quick size adjustment and a secure fit.

BraceForce addresses three major design needs:

- **Convenience and Portability:** The compact design allows users to wear it daily without disrupting other activities, and the bracelet feature makes it easy to remember before going out.
- **Safety and Effectiveness:** The steel weight delivers sufficient impact to deter threats, while the magnet and sleeve ensure quick deployment.
- **Inclusivity:** The bracelet's size and materials are adjustable to suit a wide demographic, from young adults to the elderly.

In future iterations, we aim to improve the aesthetics (i.e., style customizations), further reduce bulkiness, and consider alternative materials for enhanced comfort and reliability.

BraceForce blends functionality and discretion in a way that provides both physical defense and psychological confidence. With further development and testing, it has the potential to become an empowering tool for diverse communities concerned about personal safety.