“Sole”r Energy

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Rothberg Catalyzer Impact-a-Thon

Introduction

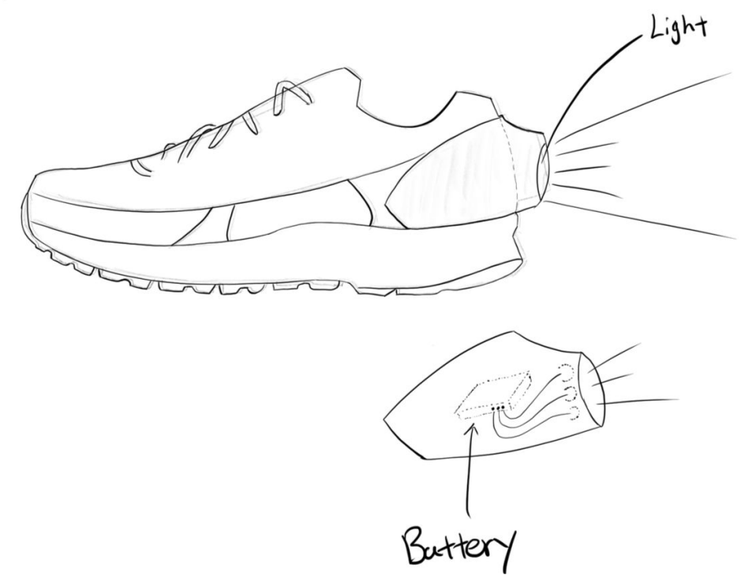
There are about 69 million refugees around the world. Although refugee camps are set up to help refugees feel more safe and provide them with the most resource possible, they lack a lot of resources such as light and electricity. Many camps struggle to provide a reliable source of light for residents. Therefore, in this project, we plan to help refugees light up their world with a cutting edge shoe sole.

Materials and Method: Prototype Demo

- Light powered by every footstep
- 2 Crank mechanism flashlights incorporated into backside of each shoe SOLE (1 step = 1 crank) [flashlight power from either battery vs. crank]
- Wooden chassis for transparent demonstration
- Ideally:

  Crank charges rechargeable battery during day
  - Stored electricity used for light source at night
  - Easily detachable light source from shoe
  - Adjustable position of light output

Ideal Model



Prototype Calculation

assumptions: e (lead acid battery) = 0.80, 4 cranks = 1sec bright light, average # steps/day (refugee) = 10,000

$$1\ person \times \frac{2\ shoes}{person} \times \frac{2\ flashlights}{shoe} \times 10{,}000\ steps \times 0.80\ (e\ battery) \times \frac{1\ sec}{4\ cranks \times 1\ flashlight} \times \frac{1\ min}{60\ sec}$$

= 120 minutes/ 2 hours of light per person