

# Vac-Cast Prosthetics

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# Project Mentors

Stephen Samouhos  
(our fearless leader)

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(our muse)

# Project Summary

- Problem: 250,000 new amputees each year worldwide
- Community partners: Jaipur Foot and the Center for International Rehabilitation
- Device: allows rapid prosthetic fitting in rural areas, resulting in a 5 fold increase in patient throughput
- Feasibility: low cost, local materials, easy integration into existing system
- Future plans: Field testing, redesign, implementation

# Problem

- There are more than 10 million amputees worldwide.
- In the US, a prosthetic leg costs \$8,000.
- The majority of amputees live in the developing world and below the poverty line.

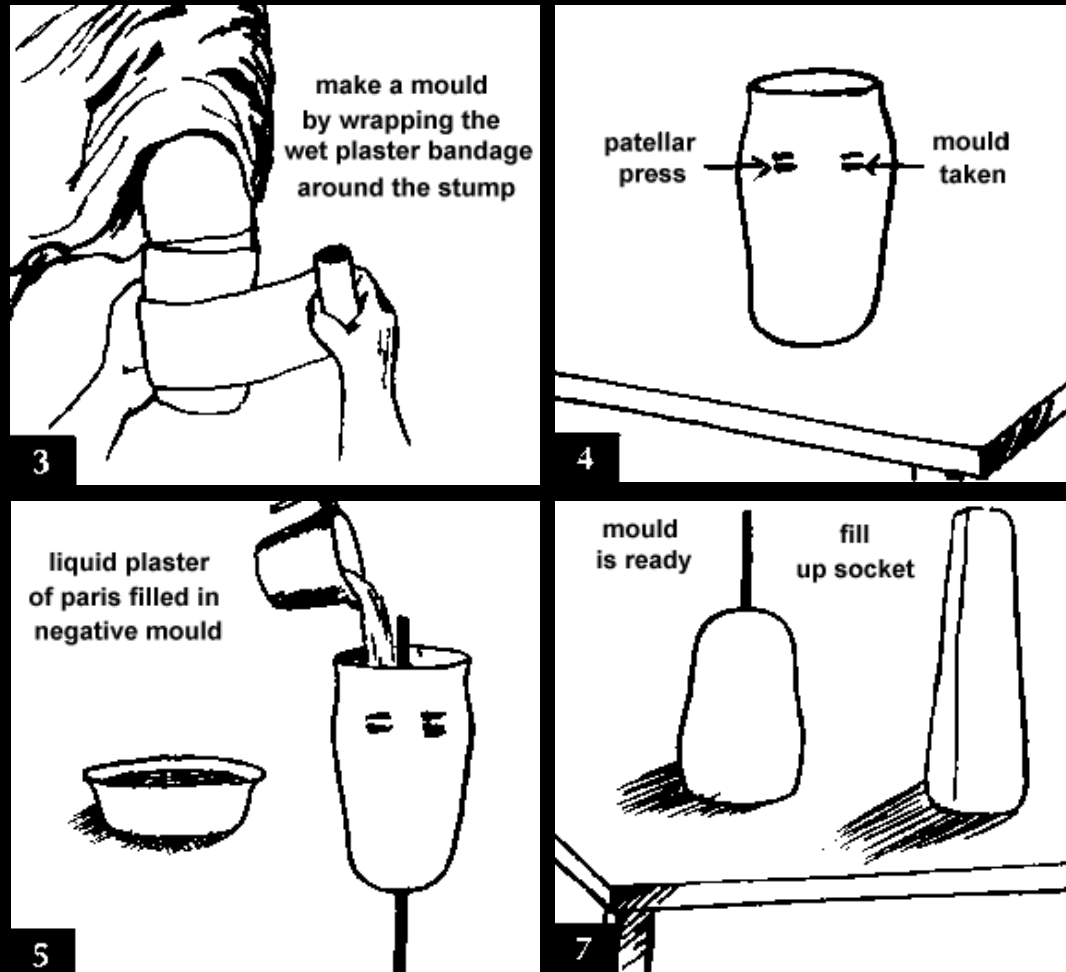
# Community Partner

- Jaipur Foot has fit over 290,000 amputees with limbs over the past 30 years.
- Prosthetics and fittings are funded by donors at \$30 per patient.
- There is no cost to the patient.

# Community Partner

- The Jaipur Foot and post are mass produced.
- The **socket** must be custom fit to each patient.
- Socket-making methods are currently slow and wasteful or restricted to areas with grid electricity.

# Current Technology: Plaster of Paris





# Current Technology: Plaster of Paris

- Takes 3-5 hours to make a socket.
- Non-reusable materials.
- 4 kg materials per patient must be transported to camp sites.

# Current Technology: Vacuum Sandcasting

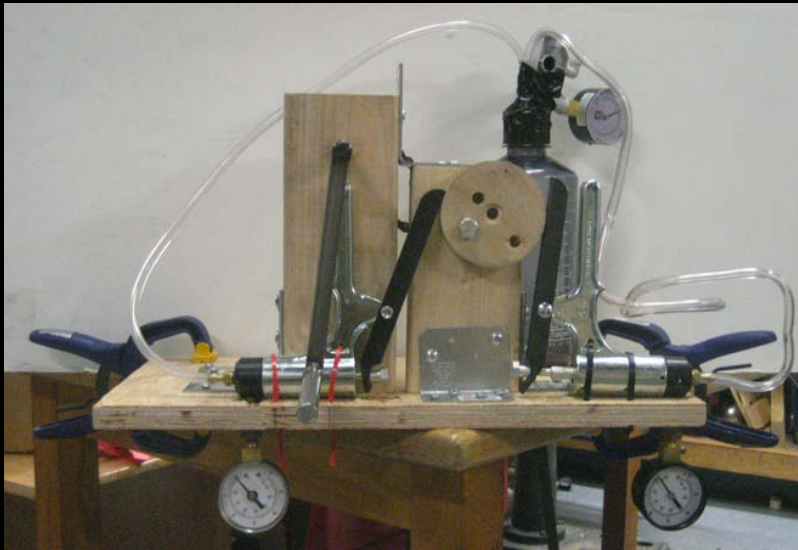


# Current Technology: Vacuum Sandcasting



- 10 minutes to make a socket.
- Reusable materials.
- Higher quality mold than POP.
- Currently requires grid electricity and an expensive compressor.

## Our Solution



- Human-powered.
- Built using locally available materials.
- Easily repaired.
- Costs \$100.
- Same critical capacity as electric technology currently in use in urban areas.
- Easily integrated into current infrastructure.

# Impact

**5 fold** increase in patient throughput.

introduction

community

technology

impact

future work



# This Summer: in Jaipur

- Getting to know our community partner.
- Learning about their manufacturing capabilities.
- Discussing other projects.

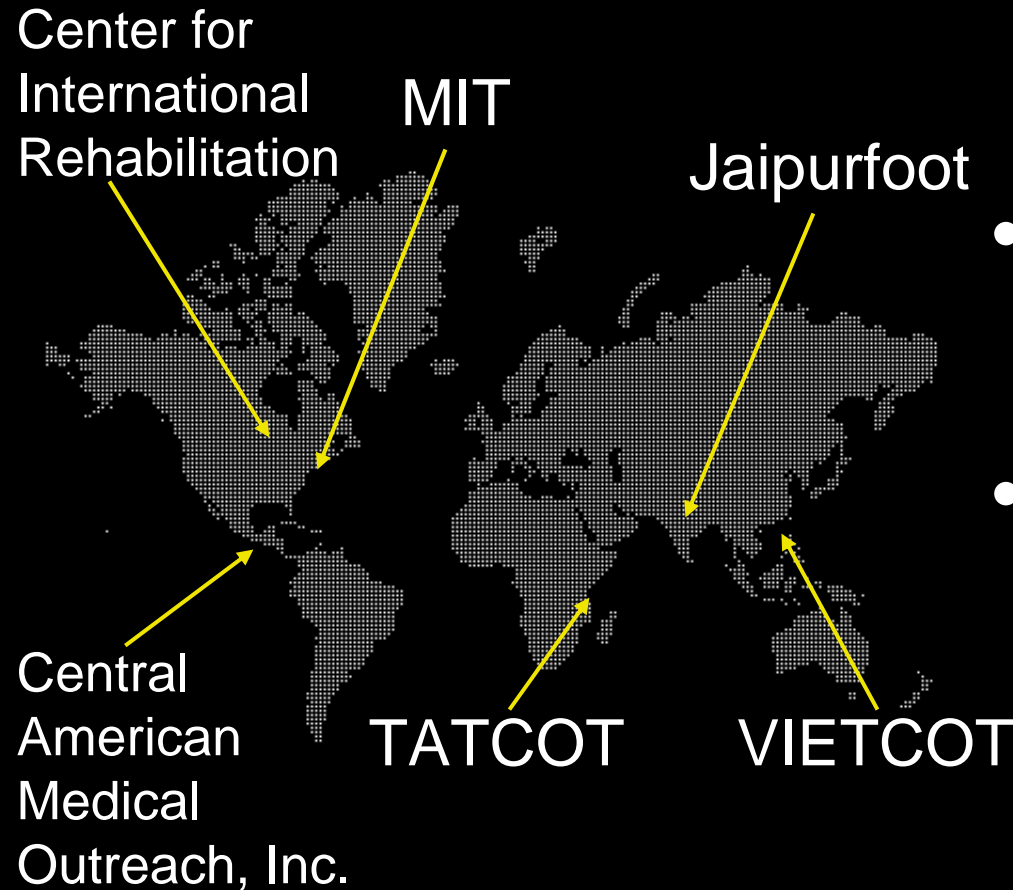


# This Summer: in Delhi

- Getting feedback on our device.
- Building a prototype using locally available materials.
- Testing in an urban center.
- Testing in a fitment camp if possible.



# Future Work



- Finding community partners in other countries.
- Working on other projects with Jaipur Foot.
- Starting a seminar with professors from MIT on rehabilitation.

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Questions?