PENNVENTION 2015

SPINESENSE

BUSINESS OPPORTUNITY

Poor posture is a ubiquitous health issue

- **Passive posture** Office work and constant use of smartphones resulting in slouching, neck bending, cause high strain on back and spine
- **Active posture** Injuries arising from incorrect technique during weightlifting. New generation, often self-directed workout regimens such as CrossFit or TRX offer little guidance as to proper technique and posture.
- **Workplace injuries** poorly executed repetitive motions occasion frequent injuries (e.g. construction workers, nurses, etc..)

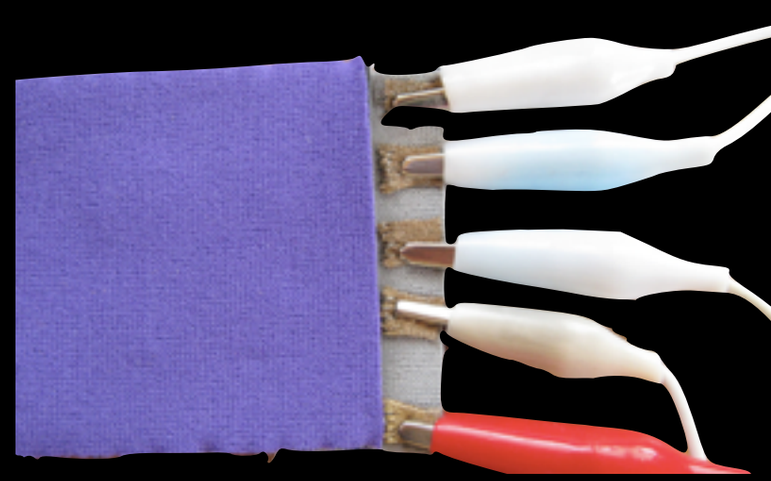
Existing solutions are inadequate:

- Stretch garments provide passive support encouraging tighter posture, yet no active monitoring
- First generation wearables (e.g. Lumoback) are bulky and approximate
- Next-generation smart garments (Sensoria Fitness smart sock, Fraunhofer FitnessSHIRT) lack accurate posture monitoring capabilities

PRODUCT

SPINESENSE IS A COMFORTABLE SMART GARMENT THAT ENABLES ACCURATE POSTURE MONITORING TO REDUCE BACK PAIN AND POSTURE-RELATED SPINAL INJURIES

- UPPER-BODY GARMENT WITH EMBEDDED SENSORS PROVIDING LIVE MONITORING OF USER'S POSTURE AND SPINE POSITION:
    - Textile electrodes provide non-intrusive solution – regular fabric feel allows garment to be used continuously under everyday clothes or directly as work out gear.
    - Proprietary algorithm aggregates the signals from multiple electrodes and generates accurate 3D map of back and spine
    - Real-time feedback through sensory (vibrating) signals via embedded components



- ASSOCIATED SMARTPHONE APP DISPLAYS REAL TIME INFO AND PROVIDES GUIDANCE:
    - "Posture alerts" warn user of bad posture while sitting or standing
    - "Active coaching" provides guidance for users looking to perfect lifting or stretching technique and avoid injury
    - Aggregated statistics and visual progress indicators

MARKET

- Low back pain is number one cause of disability worldwide
- Experts estimate 80% of population will experience back pain at some point in their life
- Americans spend at least **$50 B** each year on back pain care
- Global sportswear market expected to reach $300B by 2017
- Sports, fitness and activity monitors to grow from $1.9B/year in 2013 to $2.8B in 2019
- The market for smart textiles expected to grow from $0.7B in 2012 to $2B in 2018

SOURCES: AMERICAN CHIROPRACTIC ASSOCIATION, EUROMONITOR, STATISTA

TIMELINE

Tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Concept validation																										
Component testing and selection																										
Build proof-of-concept prototype to validate number and position of sensors																										
Mapping algorithm first implementation																										
Full scale prototype build																										
Garment design (including sensor positioning)																										
Tactile feedback implementation																										
Refinement of mapping algorithm																										
Front end interface build																										
UI design																										
Mobile application development																										
User testing and feedback																										
MVP build incorporating user feedback																										

Development budget	
Prototypes build (5 prototypes)	455
Electric components (microcontrollers, pressure sensors, accelerometers, textile electrodes, vibrating component)	*405*
Fabric	*50*
User testing	200
Mobile app development	750
Total	**1,405**

COST PER PROTOTYPE: $91

EST. COST PER UNIT IN PRODUCTION: $60

THE TEAM

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