

## UC Irvine

### SSOE Research Symposium Dean's Awards

**Title**

Gamified Respiratory Therapy Device

**Permalink**

<https://escholarship.org/uc/item/9509r593>

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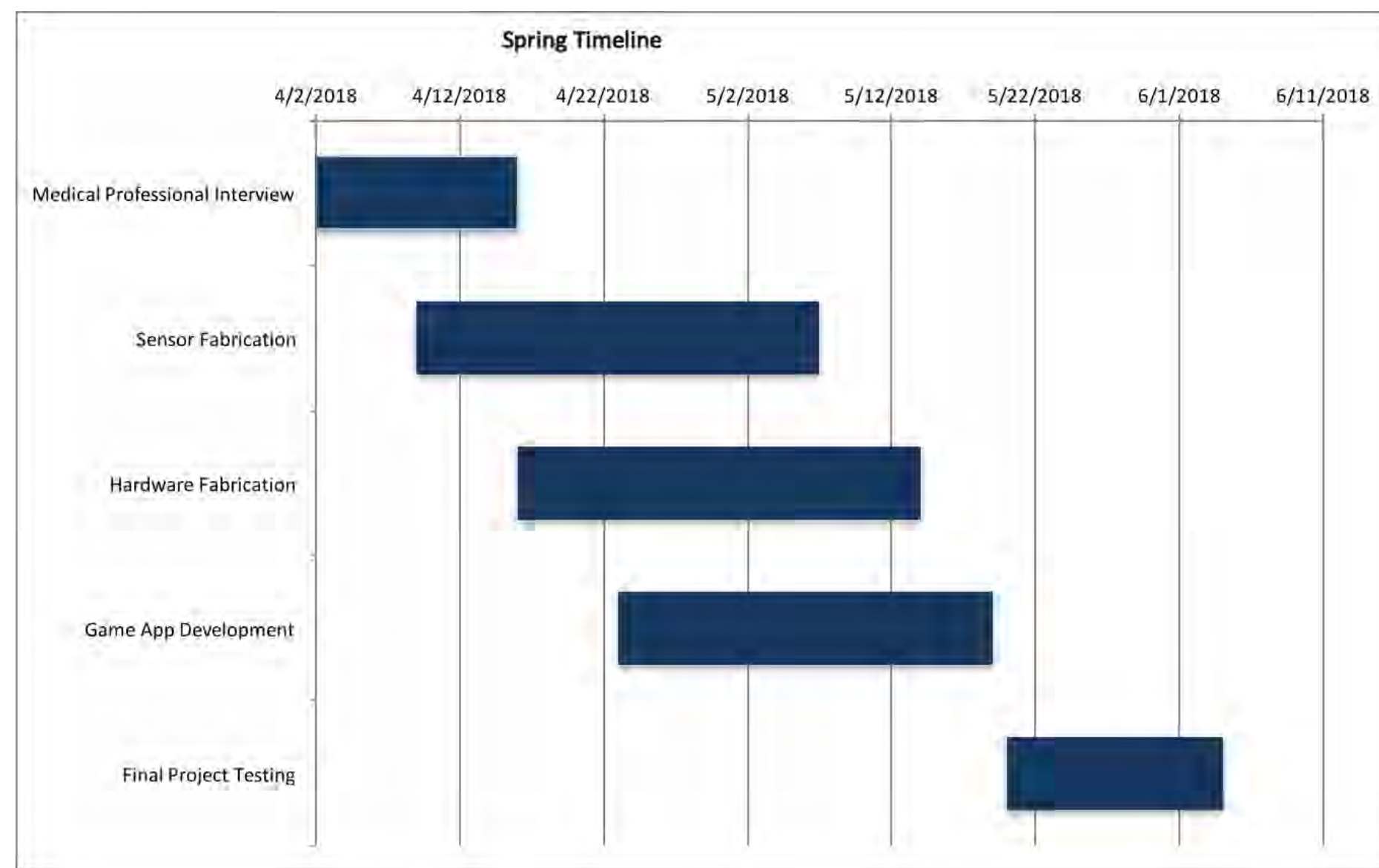
## MISSION STATEMENT

- **Objective:** To combat the low patient adherence to current respiratory therapy by creating a fun, game-based training device.

### Competitive Comparison

Product	Portable	Non-Obstructive	Comfortable	Real Time Monitoring	Incentive for Patient Compliance
Spiro	✓	✓	✓	✓	✓
Traditional Spirometer	✗	✗	✗	✗	✗
Incentive Spirometer	✗	✓	✗	✗	✓
Airway Clearance Vest	✓	✗	✗	✗	✗

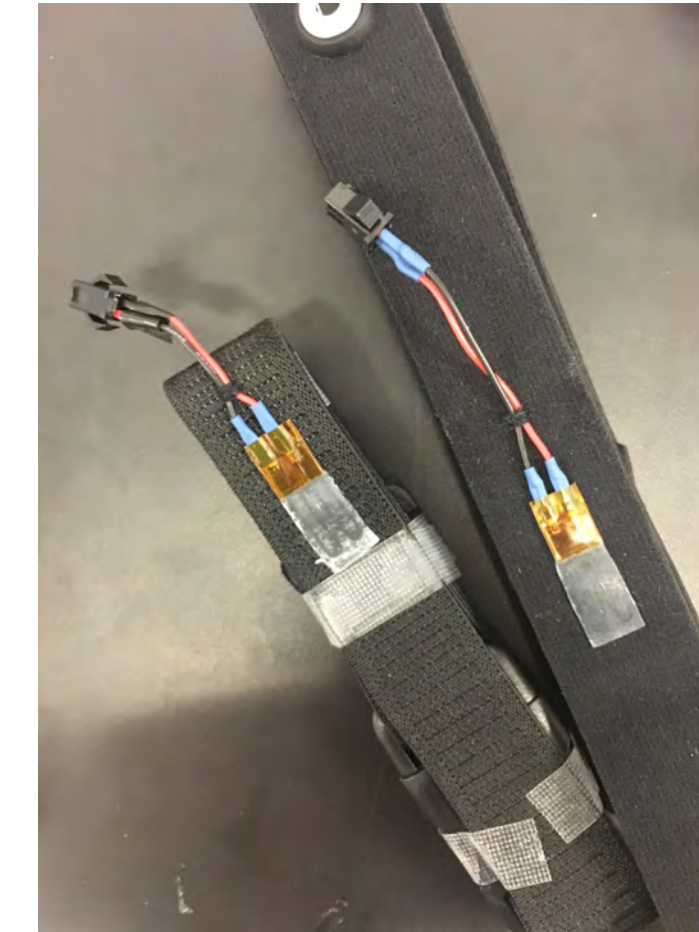
## GANTT CHART



## PROJECT CONCEPT

### Stretch Sensor

- Monitors chest wall activity
- Stretches based on inhalation and exhalation
- Less invasive alternative to breathing tube for measuring lung capacity.
- Prototype One design: Sensor embedded into elastic band.



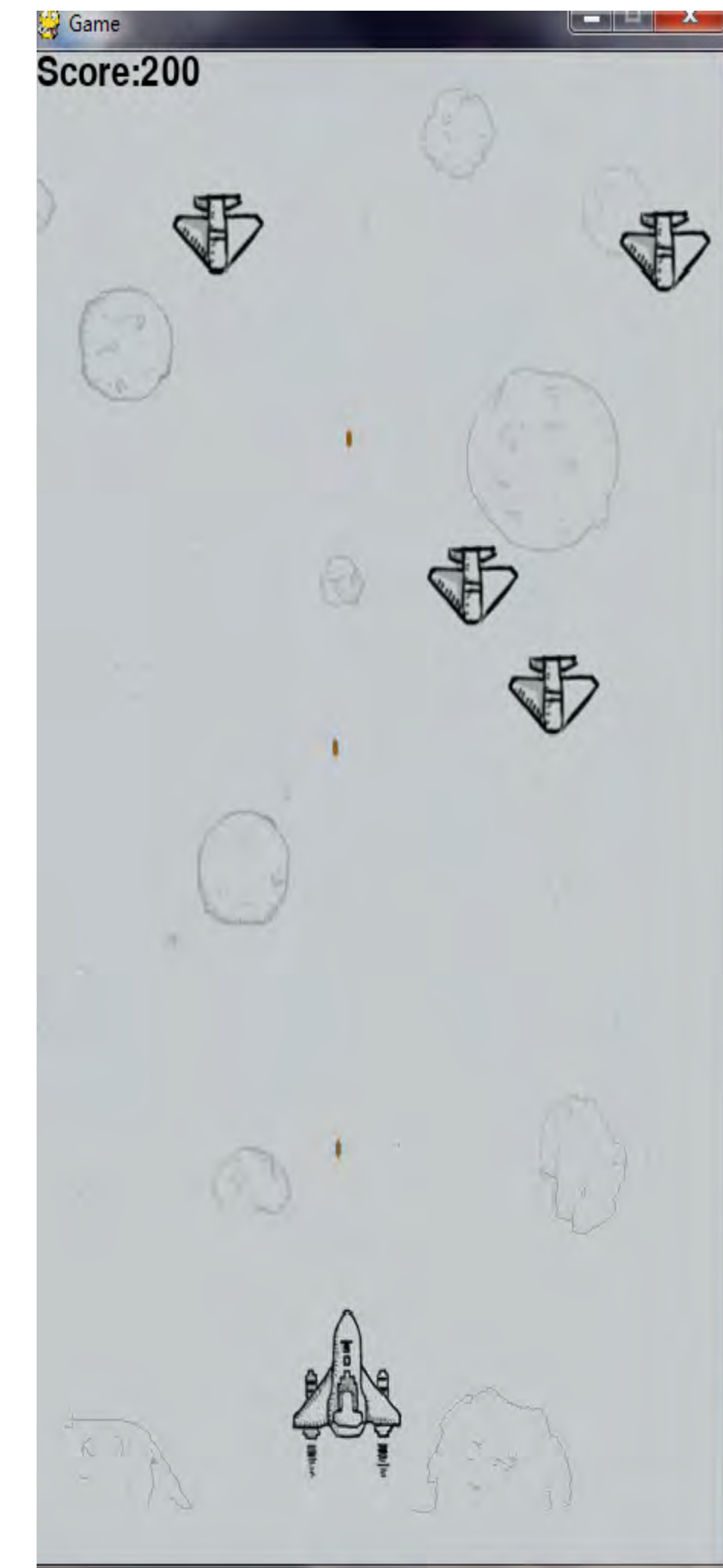
### In-Development

- Reusable sensor encapsulation housing.
- Less restrictive
- More responsive sensor encapsulation



### Software Design

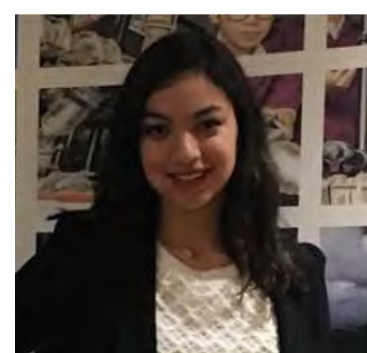
- Developed python-based game design for incentivized therapy
- Space Invader arcade game to encourage deep inhalation and exhalation.
- Calibrates to each user.
- Inhalation moves player to the right, exhalation to the left.



### In-Development

- Multiplayer feature to stimulate collaboration among patients.
- Range of mini-games options
- Cloud-based time and improvement logs for Healthcare Team

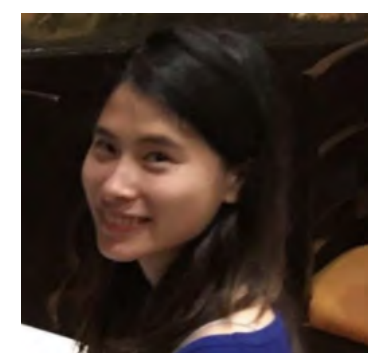
## SPIRO ENGINEERS



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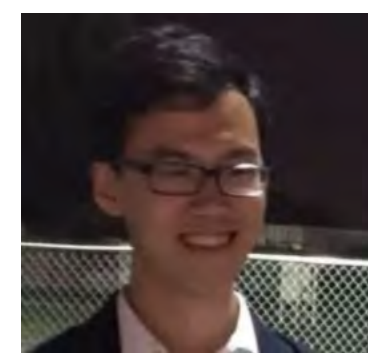
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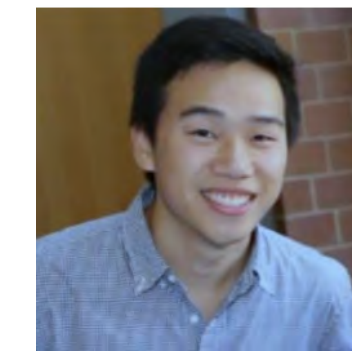
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**Zhen Wan**  
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**Alex Nguyen**  
Quality Assurance  
Device Validation

## ACKNOWLEDGEMENTS

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