**User Needs**

### Most Feared Ski Injuries

- **Leg/Knee**: 54%
- **Head/Neck**: 21%
- **Back**: 15%
- **Other**: 10%

### Bindings are a Primary Cause

- **Yes**: 78%
- **No**: 22%

From a survey of 67 skiers and members of the MIT population
**Snowfall**

**Product Concept**

**Design**

Sensors → Microcontroller → Release mechanism

**Sensors**

Dynamometers on binding measure forces, trigger release mechanism if threshold exceeded

**Use**

Force/torque threshold adjusted & remote release activated by user thru mobile app.
Key Questions

What are the force requirements for existing release mechanisms?

What are the power requirements for an electromechanical release mechanism?

1. **Binding Add-On**
   - Develop control & release mechanism that can be integrated w/ existing bindings
   - Market as a new ski accessory

2. **Binding Re-Design**
   - Redesign bindings in order to minimize power requirements
   - Market as a new, high-tech ski binding
Set-Up

Power Requirements

40N Solenoid

9V Battery, 2200 Ohm Resistor

\[ P_1 + P_2 = 22.37W \]
Key Takeaways

- Large torques (~271 Nm) needed to electromechanically actuate existing binding release mechanisms

- Power needed to drive high-force (~27 N) solenoid will drive up weight/cost

- Redesign of bindings required; attachment not realistic
Competitive Landscape

- $61M Market

<table>
<thead>
<tr>
<th></th>
<th>Tyrolia</th>
<th>Rossignol</th>
<th>Rottefella (electric)</th>
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<tbody>
<tr>
<td>Price</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Weight</td>
<td>-</td>
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<td>Adjustability</td>
<td>-</td>
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**Need:** improved adjustability of ski binding release thresholds with minimal impacts on price & weight.
Next Steps

- Release Mechanism
- Sensor Placement
- Control Interface