

Title: Ski jump launch trainer (ski jump)

Date: 11/14/2025 - 11/20/2025

Client: Prof. Walter Block and Dr. Azam Ahmed

Advisor: Prof. Randy Bartels

Team:

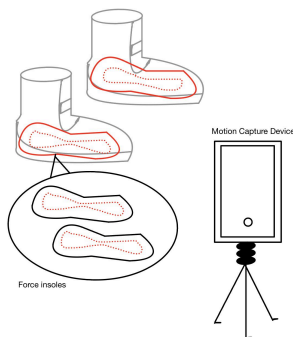
- Team Leader: Kenneth Sun
- BSAC: Caleb White
- Team Communicator: Presley Stellflue
- BPAG: Sarah Kong
- BWIG: Matthew Niemuth

Problem statement: Develop and prototype a comprehensive training system that will allow young skiers learning to jump direct comparison of their technique to professionals utilizing force plates and motion capture.

Brief status update: Now that the ski hill has closed, the group must work on fabricating two sets of force insoles that will be given to the client's daughters at the end of the project. This fabrication involved designing and fabricating an attachment method of the proto board as well as replication of the system already built, two to three times over.

Difficulties / advice requests: Determining a method for collecting data without the ski hill.

Current design:



Summary of Weekly Individual Accomplishments:

- Upcoming Team Goals: Work on fabricating the 4 insole systems needed for the two pairs that will be given to the client at the end of the project. Define a specific testing plan beyond a qualitative discussion of theory.

- Kenneth Sun: Meet with Dr. Nimunkar and brainstorm method to attach electronics to ski boot with team.
- Caleb White: Calibrate the pressure sensor insoles via a linear calibration curve in the laboratory. Once completed, if the relationship satisfies sensitivity and accuracy desired, will move onto further fabrication of the proto boards that will be needed for the final product. Continue to work on Wifi interface.
- Presley Stellflue: Will get familiar with CAD how we are going to fabricate the microcontroller holder. Will also look for velcro straps for attaching to the ski boot.
- Sarah Kong: Make and print a housing unit for the force plate insoles and brainstorm more methods for testing without the ski hill. Research methods for motion capture analysis output that will give advice to the jumpers.
- Matthew Niemuth: Finish CAD design and 3D print it. Then get velcro straps to attach to ski boot.

Item	Description	Manufacturer	Mfg Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Motion Capture System										

Tripod with Bag	60 inch lightweight tripod with adjustable-height legs and rubber feet, compatible with smartphone adapters.	Amazon Basics	WT3540	Amazon	B005KP473Q	10/1/2025	2	\$25.99	\$51.98	Amazon Basics Tripod
Tripod Mount Adapter	Smartphone holder, vertical and horizontal mount adapters for smartphones. Pack of 2	Sharing Moment Co.	H-200112	Amazon	B07S8TTH34	10/1/2025	1	\$6.99	\$6.99	Amazon Tripod Mount
Force Plate Insoles										
Force Insole Template	TPU 3D-printed template for force plate insole made of, 18.3 cm long	N/A	N/A	Wendt	N/A	10/10/2025	1	\$0.72	\$0.72	N/A
Force Insole Template	PLA 3D-printed template for force plate insole made of, 18.3 cm long	N/A	N/A	Wendt	N/A	10/13/2025	1	\$0.56	\$0.56	N/A
Force Insole Template	PLA 3D-printed template for force plate insole made of, 20.8 cm long	N/A	N/A	Wendt	N/A	10/15/2025	1	\$0.59	\$0.59	N/A
Velostat	Pressure-Sensitive Conductive Sheet 28cm x 28cm	Adafruit	1361	Adafruit	1361	10/16/2025	1	\$4.95	\$4.95	Velostat
Copper Tape	Copper foil tape with conductive adhesive 6mm x 15m	Adafruit	1128	Adafruit	1128	10/16/2025	1	\$5.95	\$5.95	Copper Tape
Accelerometers	ISM330DHCX - 6 DOF IMU - Accelerometer and Gyroscope	Adafruit	4502	Adafruit	4502	10/16/2025	2	\$19.95	\$39.90	Accelerometers
Velostat	Pressure-Sensitive Conductive Sheet 28cm x 28cm	Adafruit	1361	Adafruit	1361	10/22/2025	1	\$4.95	\$4.95	Velostat
ESP32	Adafruit ESP32 Feather Wifi + BT microcontroller	Adafruit	5400	Adafruit	5400	10/22/2025	1	\$19.95	\$19.95	ESP32
LIPO Battery	Lithium Ion Polymer Battery - 3.7V 2500mAh	Adafruit	328	Adafruit	328	10/22/2025	1	\$14.95	\$14.95	LIPO

Proto-Board	PCB Proto-Board 4cm x 6cm 3-pack	Adafruit	4785	Adafruit	4785	10/22 /2025	1	\$2.50	\$2.50	<u>prot</u> <u>o</u>
Electrical Tape	SWRT 6 Pack Black Electrical Tape 0.75in x 66ft 600V	SWRT		Amazon	B0DL NGHJ ZH	10/22 /2025	1	\$7.99	\$7.99	<u>Elec</u> <u>trica</u> <u>l</u> <u>Tap</u> <u>e</u>

Timeline:

Task	Sep			Oct					Nov				Dec	
	12	19	26	3	8	17	24	31	7	14	21	28	5	10
Project R&D														
Research	X	X	X	X	X	X	X	X	X	X				
Design			X	X	X	X	X	X	X					
Prototyping				X	X	X	X	X	X	X				
Testings								X	X	X				
Deliverables														
Progress Reports	X	X	X	X	X	X	X	X	X	X				
PDS		X												
Design Matrix			X											
Prelim Presentation				X										
Prelim Report					X									
Final Poster														
Final Report														
Meetings														
Client		X							X					
Advisor	X	X	X	X	X	X	X	X	X	X				
Website														
Update	X	X	X	X	X	X	X	X	X	X				

Filled boxes = projected timeline

X = task was worked on or completed