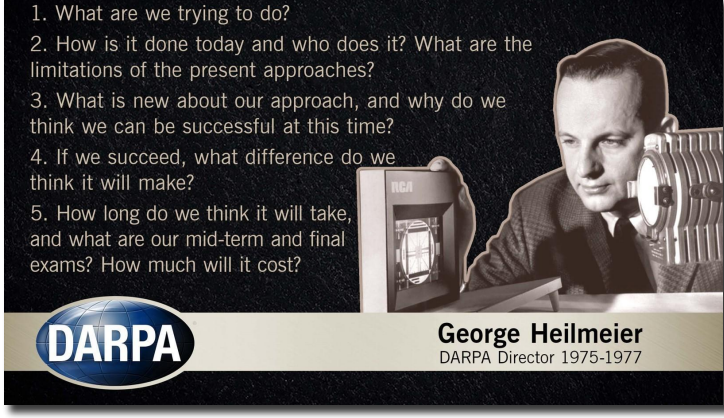
Team C4 – Back In Tune

Jessie Fan, Danny Gonzalez, Shaye Xu



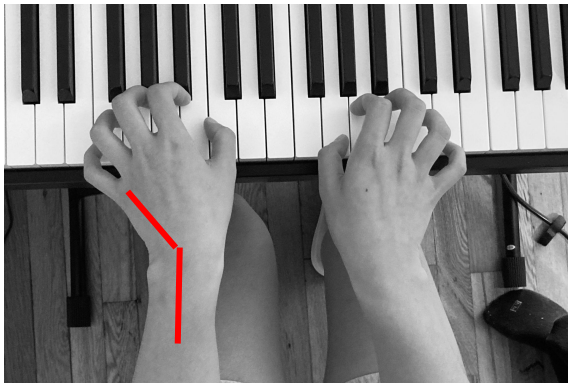
Add your 12 slides after this slide… [remember, 12 min talk + 3 min Q/A]
For more information about formatting or importing slides see:
https://gsuite.google.com/learning-center/products/slides/get-started/

Make sure to cover
(refer to the Proposal Presentation Guidance):

- Use Case - Who is your customer, what product do they want to buy?
- Use-Case Requirements - What do they expect your product to do? [Answer this Quantitavely]
- Technical Challenges - What do you need to technically achieve so your product can meet these requirements?
- Solution Approach - Show us step by step what your proposed solution path(s) looks like – incorporate flow diagrams
- Testing, Verification and Metrics – Detail your testing & verification plan (and how you will measure & verify the results) of your product
- Tasks and Division of Labor - Technical Task List to build your proposed system, WHO is going to do WHAT in your team?
- Schedule - Gantt Chart (task timeline, demo system/components, MVP, stretch goal, include slack time)

Consider that this slide already works as a introduction slide so use your first slide wisely

Remember – Relevant figures (and tables) can be worth "a thousand words"!



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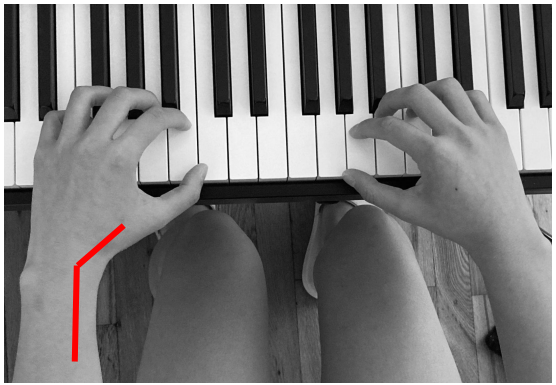

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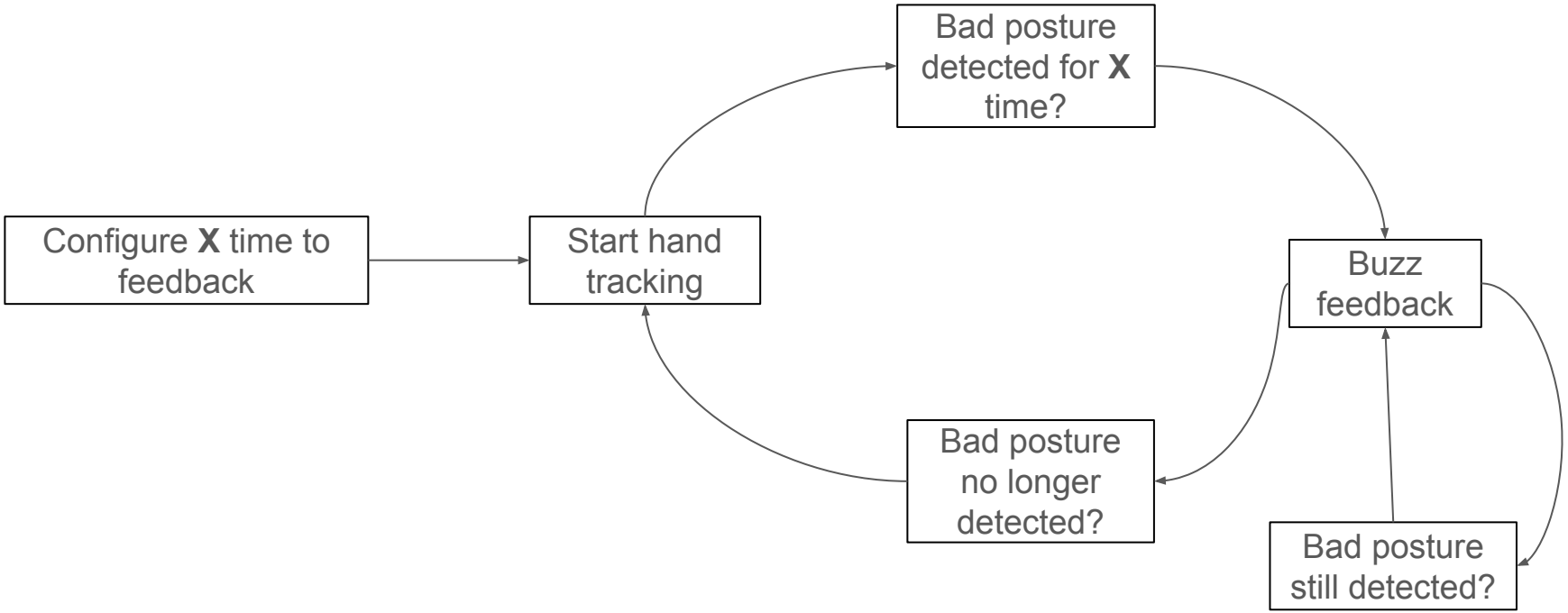
Initial Calibration Workflow

Place hands in frame

Record neutral position

Repeat across keyboard

Live feedback workflow



Live Feedback Requirements

Latency

Real time audio feedback after x time playing in poor position

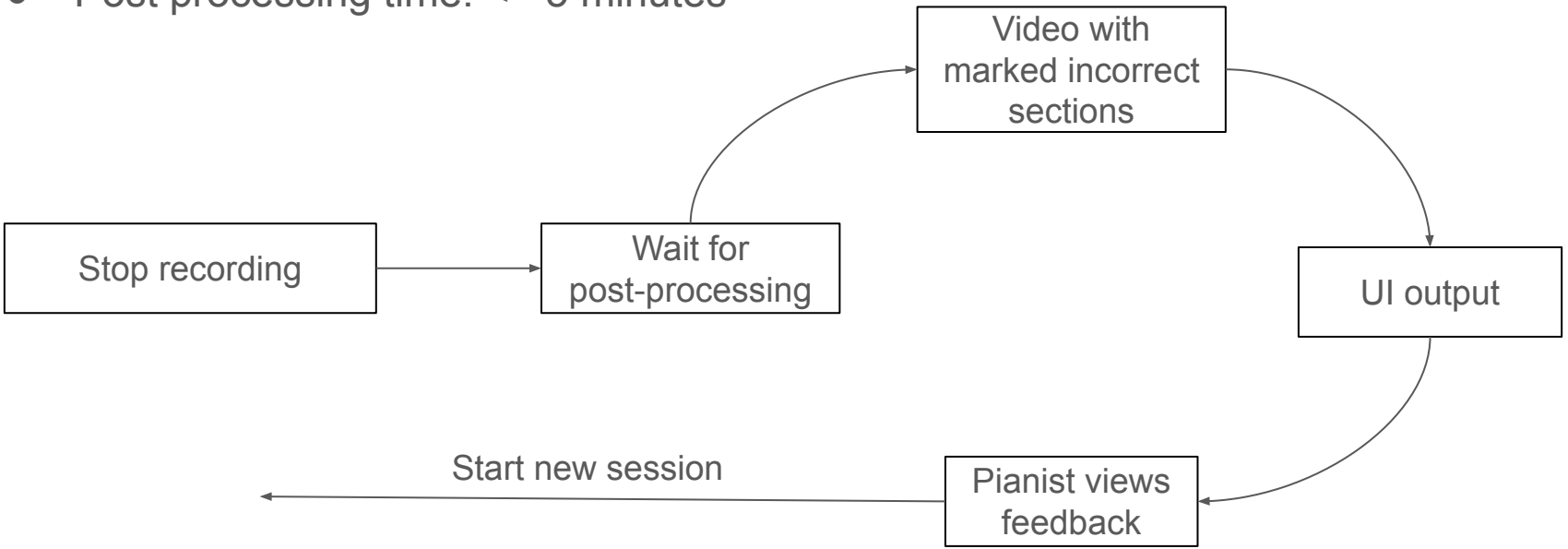
- Feedback <= 1 second after detection

Accuracy

Correctly identify incorrect posture 95% of the time

Video feedback workflow/ requirements

- Frame rate: >= 24 fps
- Post processing time: <= 5 minutes

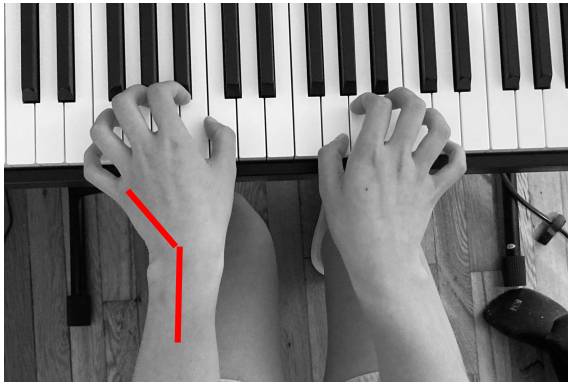


Technical Challenges

- Implementing FPGA acceleration
- Video feedback processing time meeting requirement
- Obtaining ground truth

Solution Approach (1/2)

- Camera setup
  - Tripod-like device
- MediaPipe based CV to identify incorrect position



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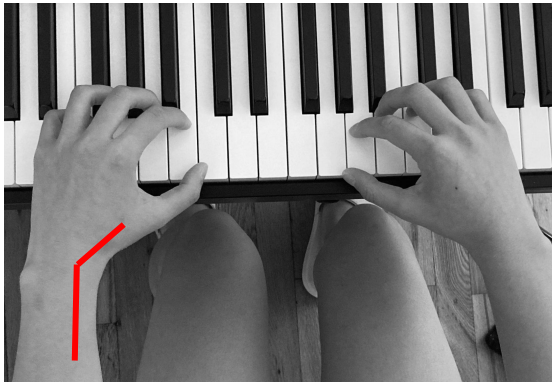

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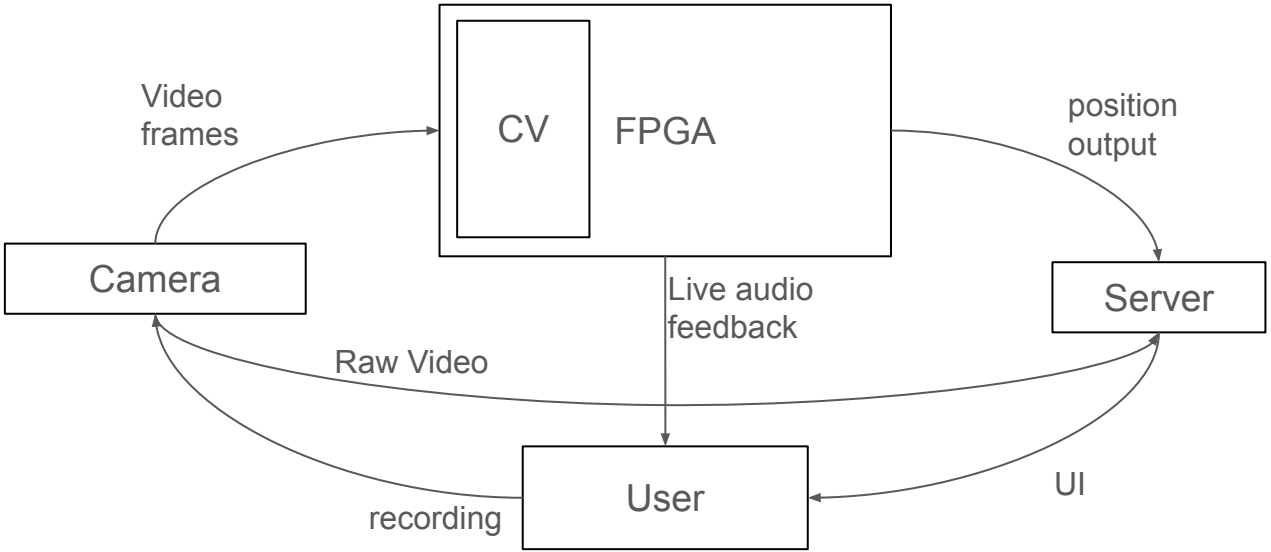
Solution Approach (2/2)

- Accelerate CV on FPGA for real time feedback
- Communicate analysis to server for UI
- Communicate video from camera to server for post processing



Testing, Verification and Metrics (1/2)

Set up and take down speed

- Verify: New user set up and take down time
- Validate: Poll users on set up and take down time

Intuitive UI

- Verify: Poll users on difficulty of using UI
- Validate: User feedback on good features and potential improvements

Testing, Verification and Metrics (2/2) :

Live feedback

- Verify: Measure live feedback latency and post processing time
- Validate: Poll users on post processing time and live audio feedback latency

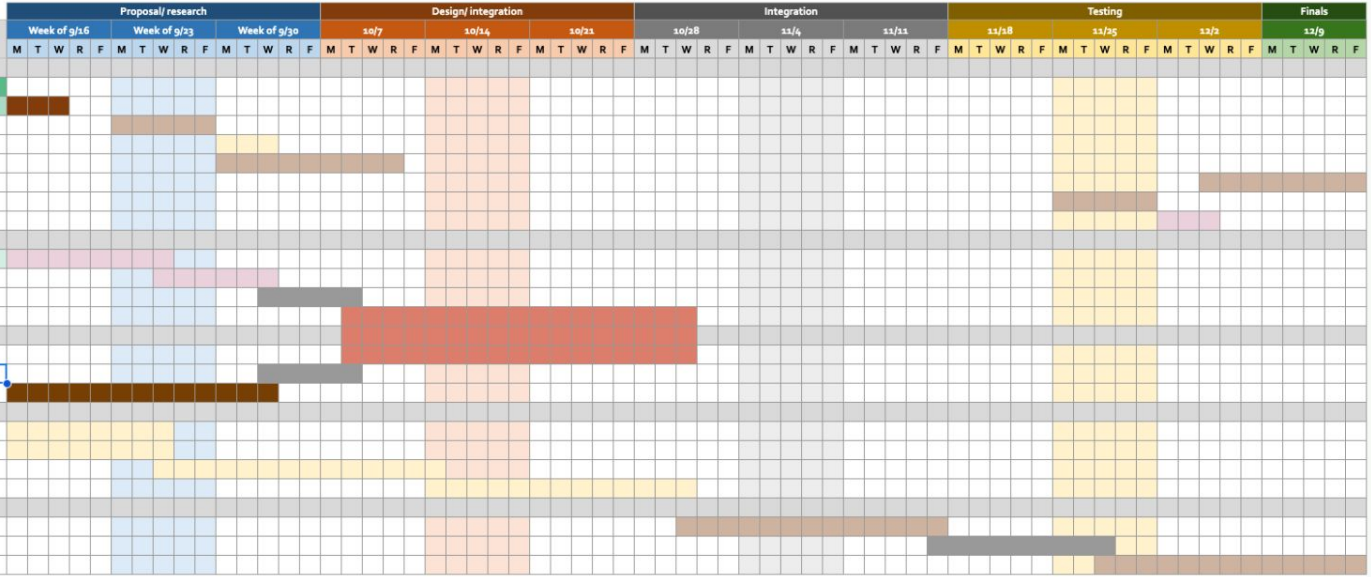
Accuracy

- Verify: Compare systems output to ground truth
- Verify: System kinematics verification
- Validate: Survey piano players if outputted information is useful

PROJECT TITLE	Capstone!	COMPANY NAME	
PROJECT MANAGER	Jessie, Danny, Shaye	DATE	

smartsheet

TASK TITLE	TASK OWNER	START DATE	DUE DATE	DURATION	PCT OF TASK COMPLETE
Logistics					
Propsal slides	All	9/9/24	9/15/24	6	100%
Proposal presentation	Jessie	9/16/24	9/18/24	2	50%
Design Slides	All	9/23/24	9/29/24	6	0%
Design presentation	Danny	9/30/24	10/2/24	2	0%
Design document	All	10/1/2024	10/11/24	10	0%
Final poster	All	12/8/24	12/15/24	7	0%
Final slides	All	11/25/24	12/1/24	6	0%
Final presentaiton	Shaye	12/1/24	12/4/24	3	0%
Computer Vision					
CV pipeline on laptop	Shaye	9/15/24	9/25/24	10	25%
External camera/ tripod integration	Shaye	9/25/24	10/2/24	7	0%
slack time	Shaye	10/2/24	10/9/24	7	0%
FPGA/CV Integration	Shaye/ Jessie	10/9/24	10/30/24	21	0%
FPGA					
FPGA/CV Integration	Shaye/ Jessie	10/9/24	10/30/24	21	0%
slack time	Jessie	10/2/24	10/9/24	7	0%
FPGA Setup	Jessie	9/15/24	10/2/24	17	0%
Webapp					
Learn webapp basics	Danny	9/15/24	9/25/24	10	0%
Survey for features	Danny	9/15/24	9/25/24	10	0%
Webapp Feature implementation	Danny	9/25/24	10/14/24	19	0%
Webapp feature finaliization	Danny	10/14/24	10/30/24	16	0%
Final integration					
Full system integratoin	ALL	10/30/24	11/18/24	18	0%
Slack time	ALL	11/18/24	11/25/24	7	0%
Verification & testing	ALL	11/25/24	12/15/24	20	0%



Shaye

Jessie

Danny

Shaye/ Jessie

Everyone

[Link to chart]

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PREVENTIO
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