

P.I.C.A.S.S.A.U.

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PROBLEM STATEMENT

- Design a system to render a photograph from an image onto a Canvas
 - Two ways: Through webcam or direct upload
- End Goal: simplified painting of original picture




TECHNICAL APPROACH

Standards Utilized

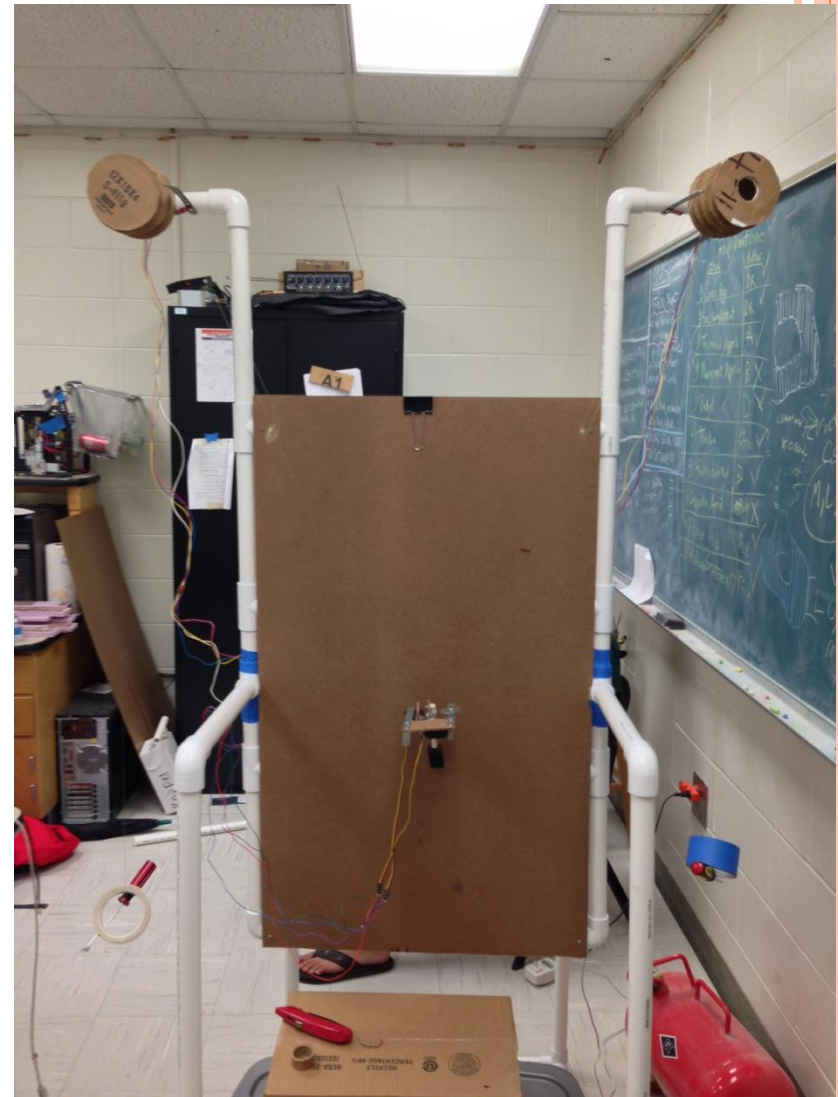
- RS-232 Serial Connection
- SVG (Scalable Vector Graphic) file format
- XML (Extensible Markup Language)

Constraints Considered

- Limited colors (three or four)
 - Limited brush size and resolution of paintings
 - Weight of brush carriage
 - Canvas size (22" by 36")
 - Time to paint
 - Cost of final parts (\$300 total cost limit)
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DESIGN SUMMARY

- PVC pipe frame and supports
- 2 stepper motors and spools
- Brush carriage and servos
- SVG file to coordinate list (Python)



POTENTIAL PROBLEMS

- Hardware
- Software
- Miscellaneous



MANAGEMENT APPROACH

- Democratic decision making
- Leader/secretary rotation
- Communication through various channels
- Regularly scheduled meetings



BUDGET

Item	Purpose	Estimated Cost
Stepper Motors	to replace the underpowered motors used in the prototype	\$100
Frame Hardware	to support the hardware	\$20
Mounting Hardware	to mount the spindles onto the motors	\$15
Painting Supplies	brushes, paint, and canvas/ posterboard	\$15
Motor Controllers	to drive the stepper motors	\$20
Raspberry Pi	to run the software	\$35
Display	to interface with the raspberry pi	\$15
Webcam	to take pictures to paint	\$15
Microcontroller	to interface with the hardware	\$10
Miscellaneous Electronics Hardware	wires, sensors, servos, etc.	\$20
TOTAL		\$265



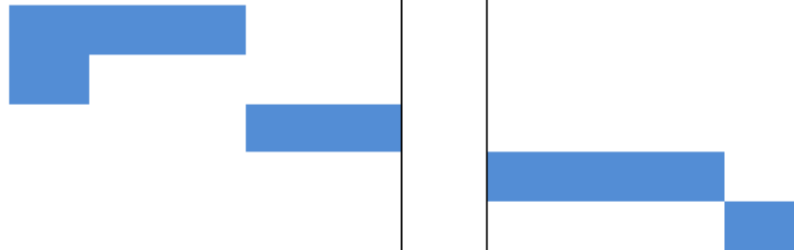
TIMELINE



	Mon Sep 2					End of Cycle 1								End of Cycle 2	Senior Design Fair	
ISO WEEK NUM	W36	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	
Month (MON)DAY	S 02	S 09	S 16	S 23	S 30	O 07	O 14	O 21	O 28	N 04	N 11	N 18	N 25	D 02	D 09	

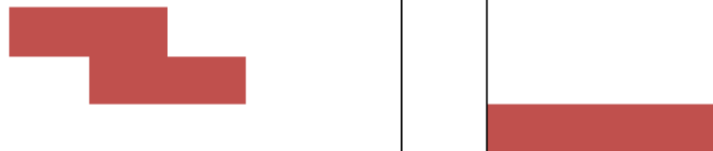
Mechanical Hardware

- Improve motor mounts
- Reinforce support
- Build paint platform
- Stabilize paintbrush platform
- Mount electrical hardware



Electrical Hardware

- Improve stepper motors
- Research power supply options
- Stabilize paintbrush platform



TIMELINE CONT...

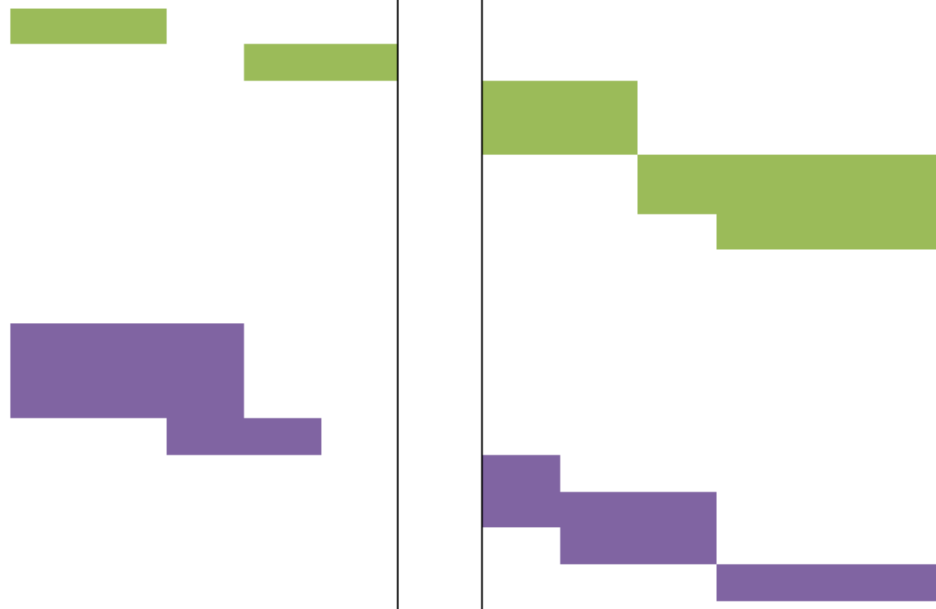
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Computer Software

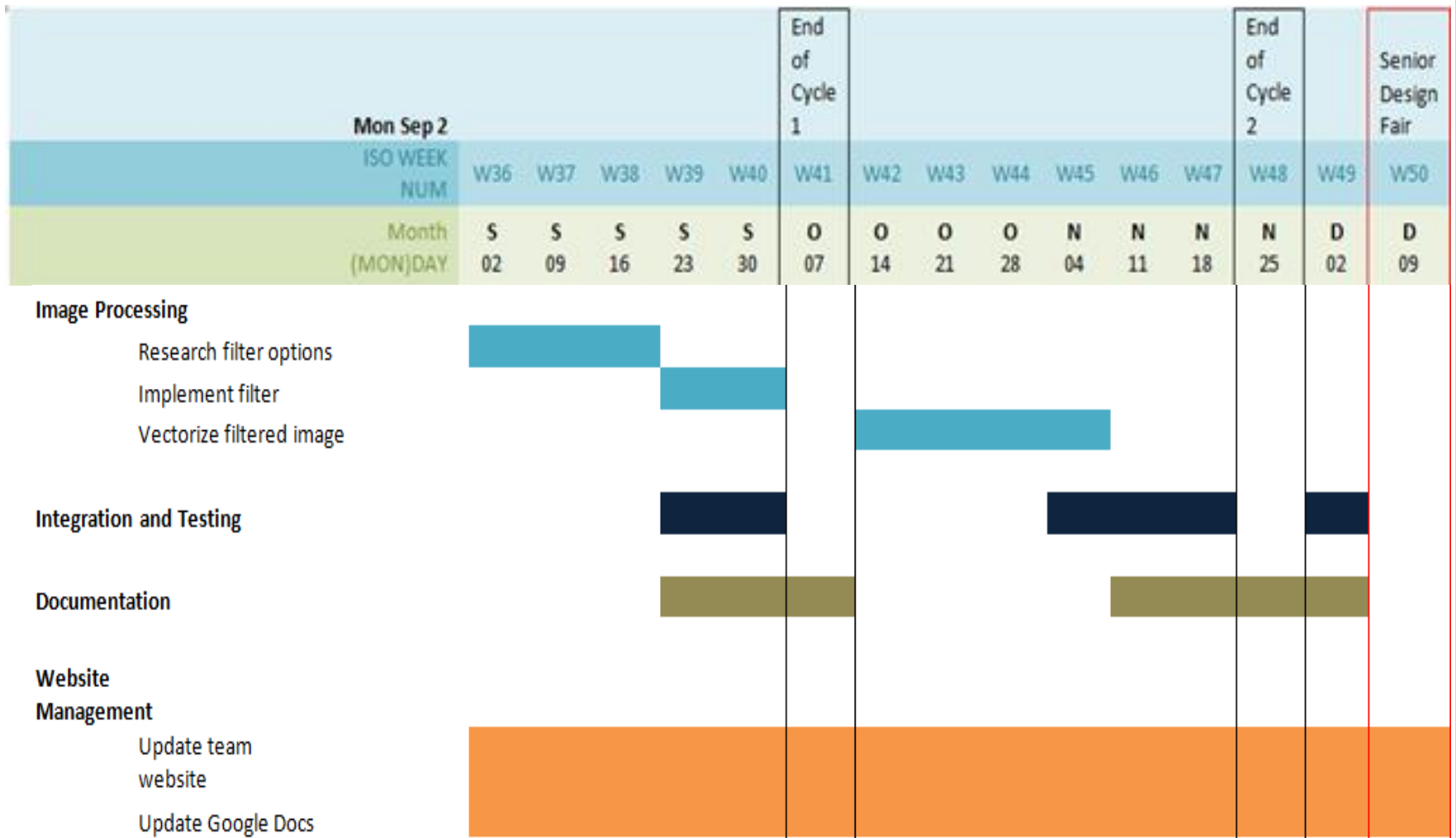
- Debug prototype
- Support for multiple colors
- Setup Raspberry Pi
- Order screen
- Create GUI
- Optimize drawing paths

Embedded Software

- Improve paintbrush dipping
- Reduce position jitter
- Develop calibration routine
- Support for multiple colors
- Stabilize paintbrush platform
- Implement brush rotation
- Optimize calculation time



TIMELINE CONT...



FACILITIES TO BE USED

- SPaRC Lab
- Senior Design Lab

