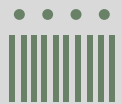
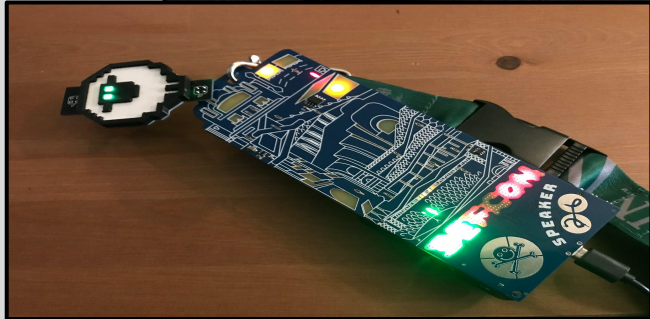


VETCON BADGE

Team 32

Derek Barbosa, John Kircher, Carlos Ortiz, Julian Padgett,
Ryan Sullivan

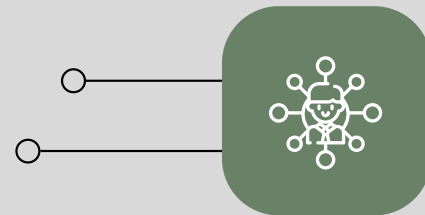




Our Project

What are we actually doing?

Providing a detailed blueprint for an identification "badge" to be used by VETCON in the upcoming DEFCON conference that sticks with a Cybersecurity theme.



What is DefCon?

The world's longest running and largest underground hacking conference.

Deliverables

Functional Badge

Working badge that meets all design constraints

Bill of Materials

Accurate bill of materials for badge production

Badge Manual

Assembly & installation instructions, troubleshooting procedures, microcontroller flashing

Badge Production

Process for mass badge production



Requirements: Functions

Badge Functions

```
graph LR; A[Badge Functions] --- B[Communication]; A --- C[Construction]; A --- D[Cost & Production];
```

Communication

Provide users with easy communication with other badges users

Construction

Easy but rewarding construction of badges

Cost & Production

An affordable price for those hoping to order a badge



Requirements: Objectives



Point-Point Networking

Communication between
two endpoints

USB-C

Charging, data transfer,
software flashing

1

2

3

4

5

Operating System

System software to manage
our microcontroller(s) and
ROMs

Battery Life

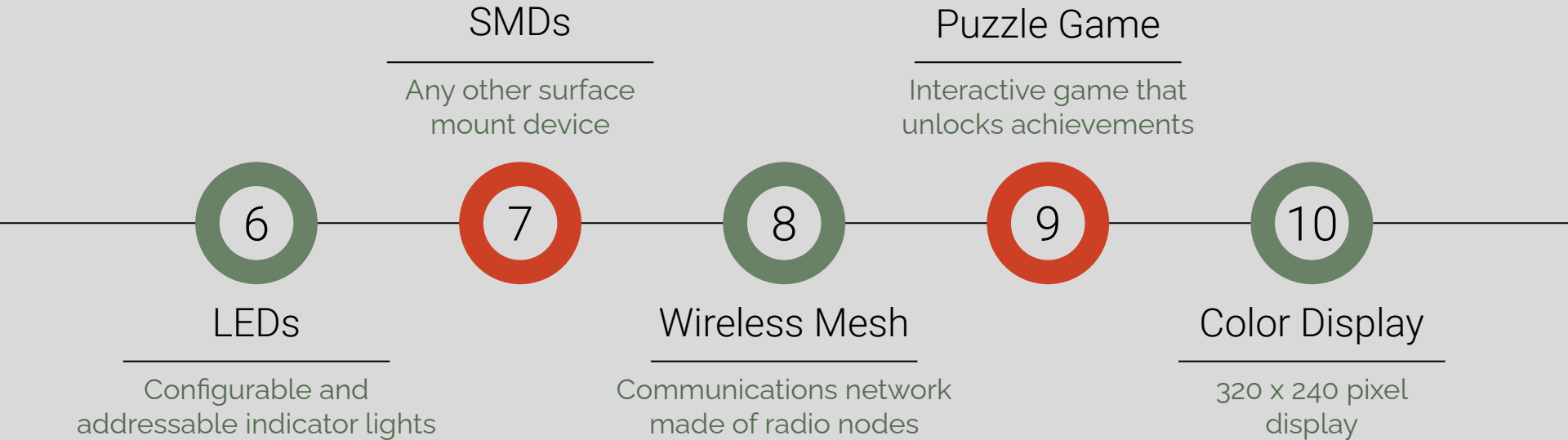
Ability to operate for
21 hours; $\sigma = 2.1$

Interface Switch

On/Off/Data
Transfer Switch



Requirements: “Stretch Goals”



Requirements: Constraints



Size

4" wide, 4" long, 1"
deep



Weight

150 grams



Lanyard

Attachment points
for wearing

UP



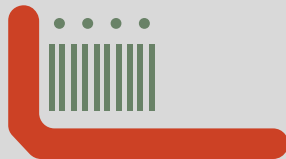
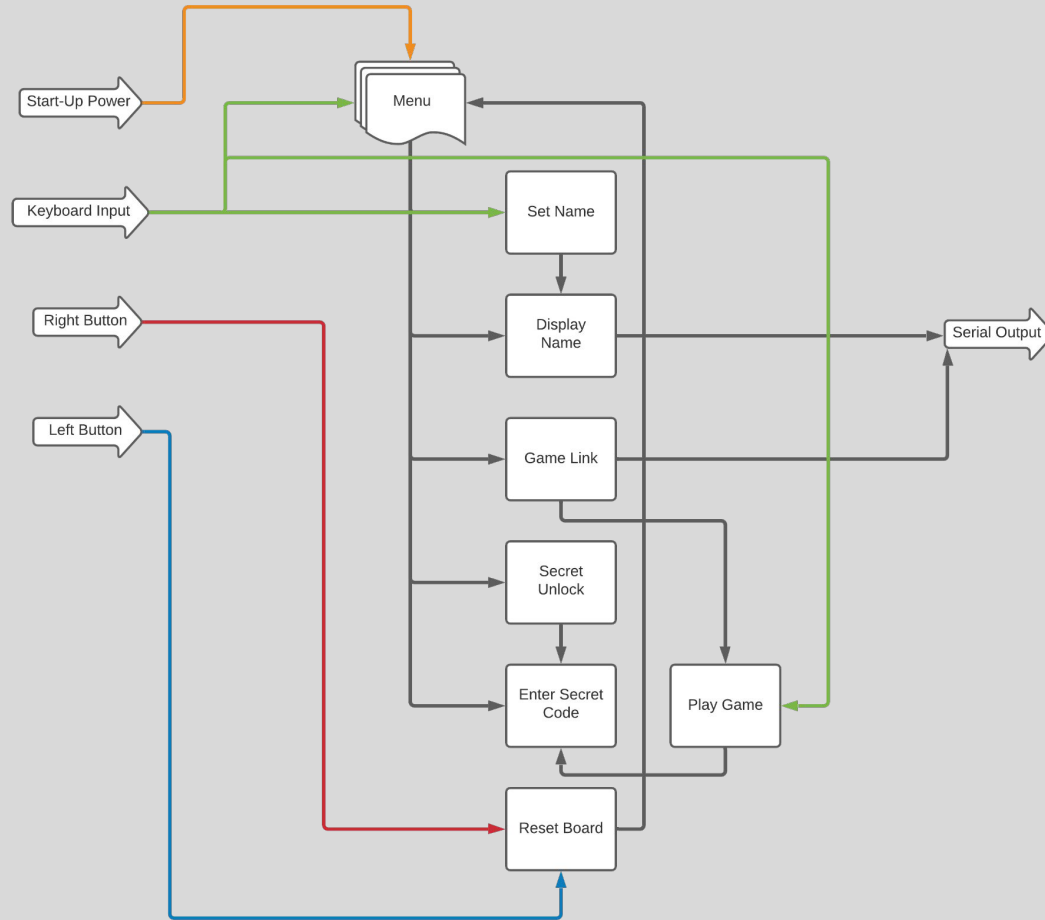


Describing Our Technical Approach

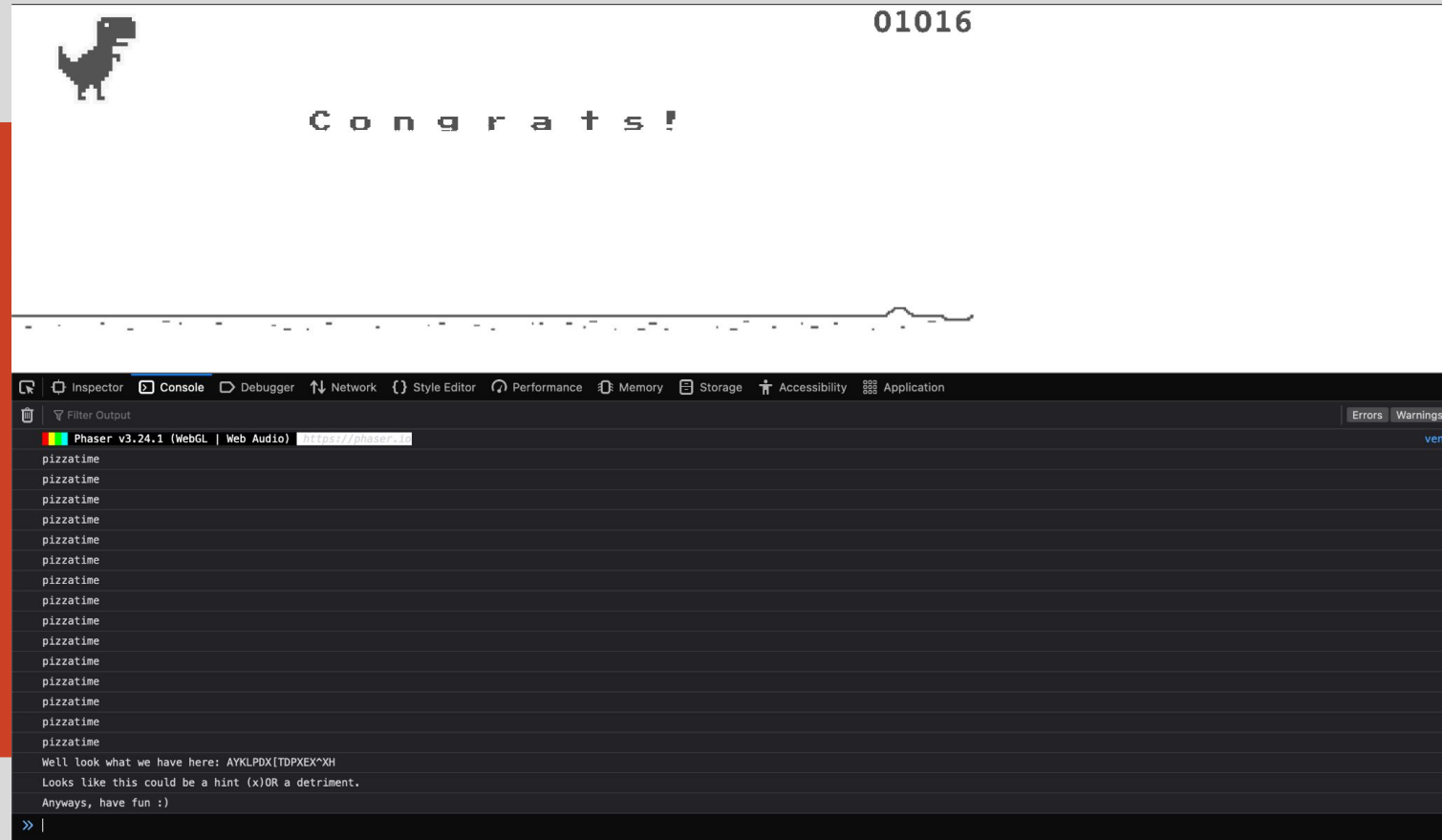


DOWN

System Block Diagram



Game 1 Screenshot



Game 2 Screenshot

The screenshot shows a game interface with a 5x5 grid. The grid contains numbers 1-5 in the top row and letters A-Z in the remaining rows. A central overlay features a skull and crossbones icon, a 'Heads: 0' / 'Tails: 0' counter, and 'Flip Coin' and 'Reset' buttons. The bottom of the image shows a browser's developer console with the Storage tab open, displaying a cookie for 'https://derekbarbosa.github.io'.

	1	2	3	4	5
1	A	B	C	D	E
2	F	G	H	I/J	K
3	L	M	N	O	P
4	Q	R	S	T	U
5	V	W	X	Y	Z

Heads: 0 Tails: 0

Flip Coin Reset

Inspector Console Debugger Network Style Editor Performance Memory Storage Accessibility Application

Cache Storage

Cookies

Indexed DB

Local Storage

Session Storage

Name	Value	Domain	Path	Expires / Max-Age	Size	HttpOnly	Secure	SameSite	Last Accessed
heads	4315323515421424431334	.derekbarbosa.gith...	/	Sat, 02 Apr 2022 20:57:15...	27	false	true	None	Thu, 17 Mar 2022 17:09:19...

Filter values

Data

heads: "4315323515421424431334"

Created: "Thu, 03 Mar 2022 21:57:15 GMT"

Domain: ".derekbarbosa.github.io"

Expires / Max-Age: "Sat, 02 Apr 2... 20:57:15 GMT"

HostOnly: false

HttpOnly: false

Last Accessed: "Thu, 17 Mar 2022 17:09:19 GMT"

Path: "/"

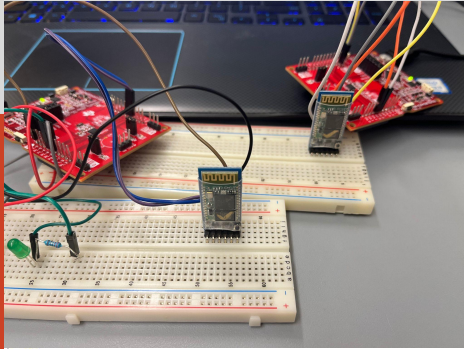
SameSite: "None"

Persistent State

```
void wipeBoard(){  
    SYSCFG0 = FRWPPW | DFWP;  
    startFlag = 0;  
    secretFlag = 0;  
    nameToggle = 0;  
    secretFlag2 = 0;  
    secretFlag3 = 0;  
    wrongFlag = 0;  
    clearStr(name);  
    SYSCFG0 = FRWPPW | PFWP | DFWP;  
    return;  
}
```

```
18  
19     int startFlag PLACE_IN_FRAM;  
20     int secretFlag PLACE_IN_FRAM;  
21     int nameToggle PLACE_IN_FRAM;  
22     int secretFlag2 PLACE_IN_FRAM;  
23     int secretFlag3 PLACE_IN_FRAM;  
24     int wrongFlag PLACE_IN_FRAM;  
25  
26     char name[NAMELEN] PLACE_IN_FRAM;  
27     char secret_word[NAMELEN] PLACE_IN_FRAM;
```

Bluetooth



```
COM8 - PuTTY
*| MENU |*
*| |*
*| 1: Set Name Tag |*
*| 2: Display Name Tag|*
*| 3: Game Link |*
*| 5: Game Link 2 |*
*| 8: Start Bluetooth |*
*| 0: Reset Badge |*
*| |*
*****
Please enter input
Input: 8

Bluetooth Entered
Exit Bluetooth Menu to Return

Welcome to Bluetooth
Your Device Should Automatically Connect to the Closest VETCON BADGE
Type 1 to Start Communication:
Type 0 to Exit:
You entered 1

Are you at vetcon?
```

```
COM5 - PuTTY
*| MENU |*
*| |*
*| 1: Set Name Tag |*
*| 2: Display Name Tag|*
*| 3: Game Link |*
*| 5: Game Link 2 |*
*| 8: Start Bluetooth |*
*| 0: Reset Badge |*
*| |*
*****
Please enter input
Input: 8

Bluetooth Entered
Exit Bluetooth Menu to Return

Welcome to Bluetooth
Your Device Should Automatically Connect to the Closest VETCON BADGE
Type 1 to Start Communication:
Type 0 to Exit:
You entered 1

Yes I am
```

Gantt Chart (predicted)

VETCON BADGE

Team 32

EC 463

Project Start:

Thu, 1/20/2022

Display Week:

1

[illegible]

VETCON BADGE

Team 32
EC 463

Project Start: Thu, 1/20/2022

Display Week: 9

TASK	ASSIGNED TO	PROGRESS	START	END
PCB / Hardware Design / Software WrapUp				
Layout Electrical Parameters	to be assigned...	0%	3/6/22	3/20/22
Create Schematic	.	0%	3/6/22	2/24/22
Transfer to KICad Schematic Tool	.	0%	2/24/22	3/19/22
LCD Finalization (anticipated)	.	0%	2/14/22	3/21/22
Software Fixes (to be defined)	.	0%	1/28/22	3/9/22
Generate Design & Outsource Assembly	.	0%	3/21/22	4/4/22
Customer Installation				
Badge Demo	to be assigned...	0%	4/8/22	4/18/22
Bill of Materials Overview	.	0%	4/18/22	4/25/22
Badge Manual Overview	.	0%	4/25/22	5/2/22
Customer Installation Feedback	.	0%	5/2/22	5/6/22
ECE Day / Planning				
Logbook Reviews	to be assigned...	0%	3/6/22	6/20/22
Functional Test Planning	.	0%	4/1/22	5/1/22
ECE Day Hardware/Software Setup	.	0%	5/1/22	5/4/22
ECE Day Presentation Practice	.	0%	5/1/22	5/4/22
To be added...	.	0%		

Team 32

EC 463

Project Start:

Thu, 1/20/2022

Display Week:

9

Display Week: 9					Mar 14, 2022							Mar 21, 2022							Mar 28, 2022							Apr 4, 2022							Apr 11, 2022							Apr 18, 2022							Apr 25, 2022							May 2, 2022						
					14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8
Task	Assigned To	Progress	Start	End	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S							
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Create Schematic	.	0%	3/6/22	2/24/22																																																								
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ECE Day Presentation Practice	.	0%	5/1/22	5/4/22																																																								
To be added...	.	0%																																																										

What still needs to be done?

Requirements

- Have a finished KiCad schematic
- BT "friending" feature
- 10 prototypes ready for ECE day
- Full bill of materials
- Board user manual

Stretch Goals

- Alphanumeric LCD operational



Thank You

