Automated Toothbrush

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Introduction

People with ASD often struggle with keeping a consistent schedule with many aspects of their lives. One of the more important ones to maintaining their bodies is oral hygiene. This project seeks to assist them and their caretakers within the 8th street community and potentially more abroad by creating a sleeve that can fit around any standard toothbrush and a connected application that can be used to by their caretakers and themselves to monitor brushing habits.

Requirements

- The sleeve produces accurate brushing data.
- The sleeve is waterproof and comfortable to use.
- The associated application allows the user to view their brushing data.
- The associated application allows caretakers to view brushing data.
- The associated application provides the user with configurable notifications.
- The associated application has an easy to use UI.

System Design

- When the user is brushing, the sleeve tracks its movement and waits for 10 seconds of motion, and when it detects this lack of motion it ends the brushing session.
- After this, it transmits the data via Bluetooth to the associated application.
- From here, the Raspberry Pi processes the data for display on the application.
- Once the data is processed, its available for viewing by the user as well as their caretaker.
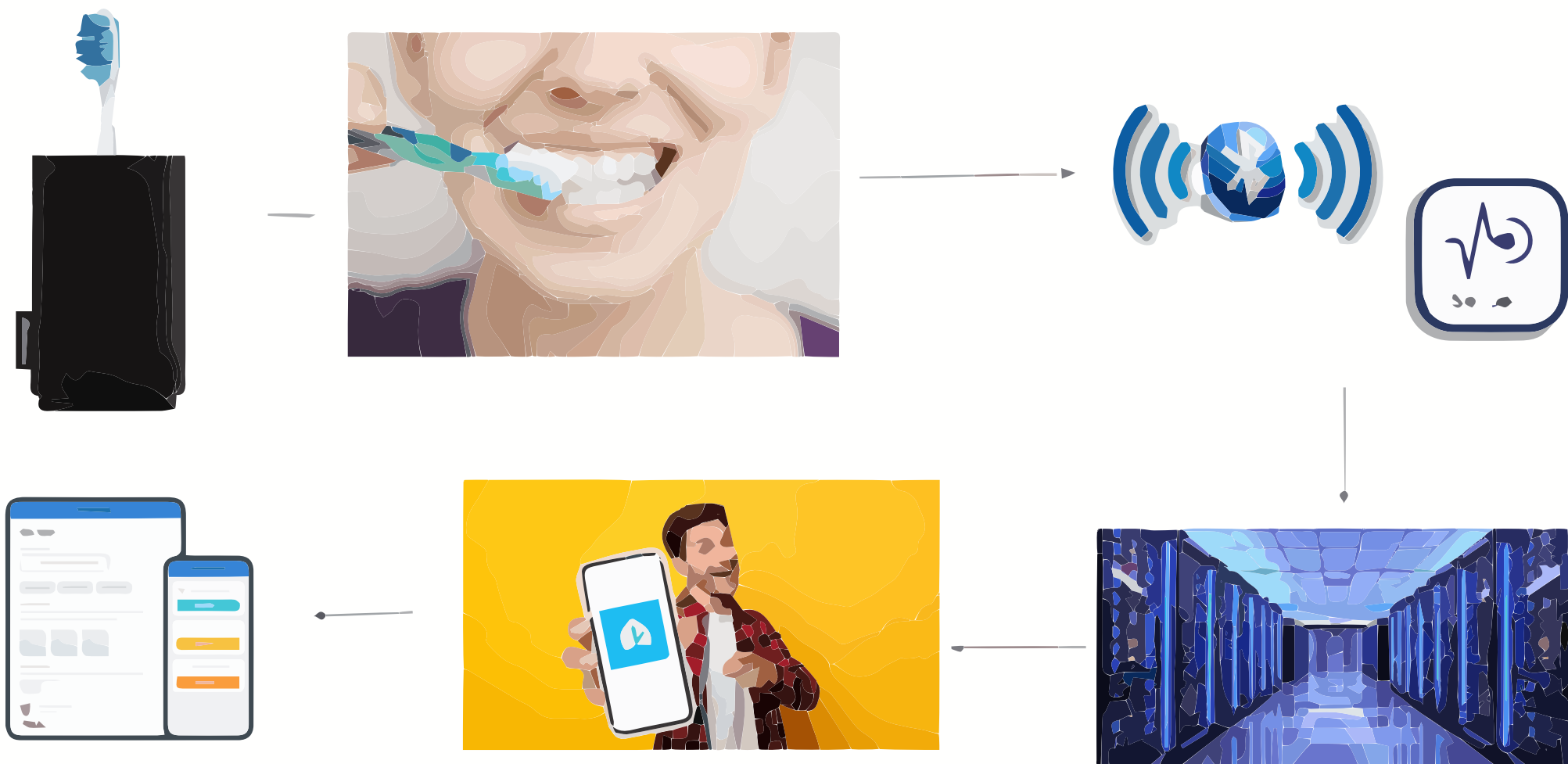
Conclusion

- Our project addresses a critical and often overlooked need, assisting individuals with autism in maintaining proper oral hygiene
- By developing a sensor-equipped sleeve that easily integrates with any standard toothbrush and a user-friendly Home Assistant Add-on, we aim to foster more consistent and effective brushing habits
- Some future work includes visually updating UI, creating our Add-on for Home Assistant, and testing of all components of our project together.
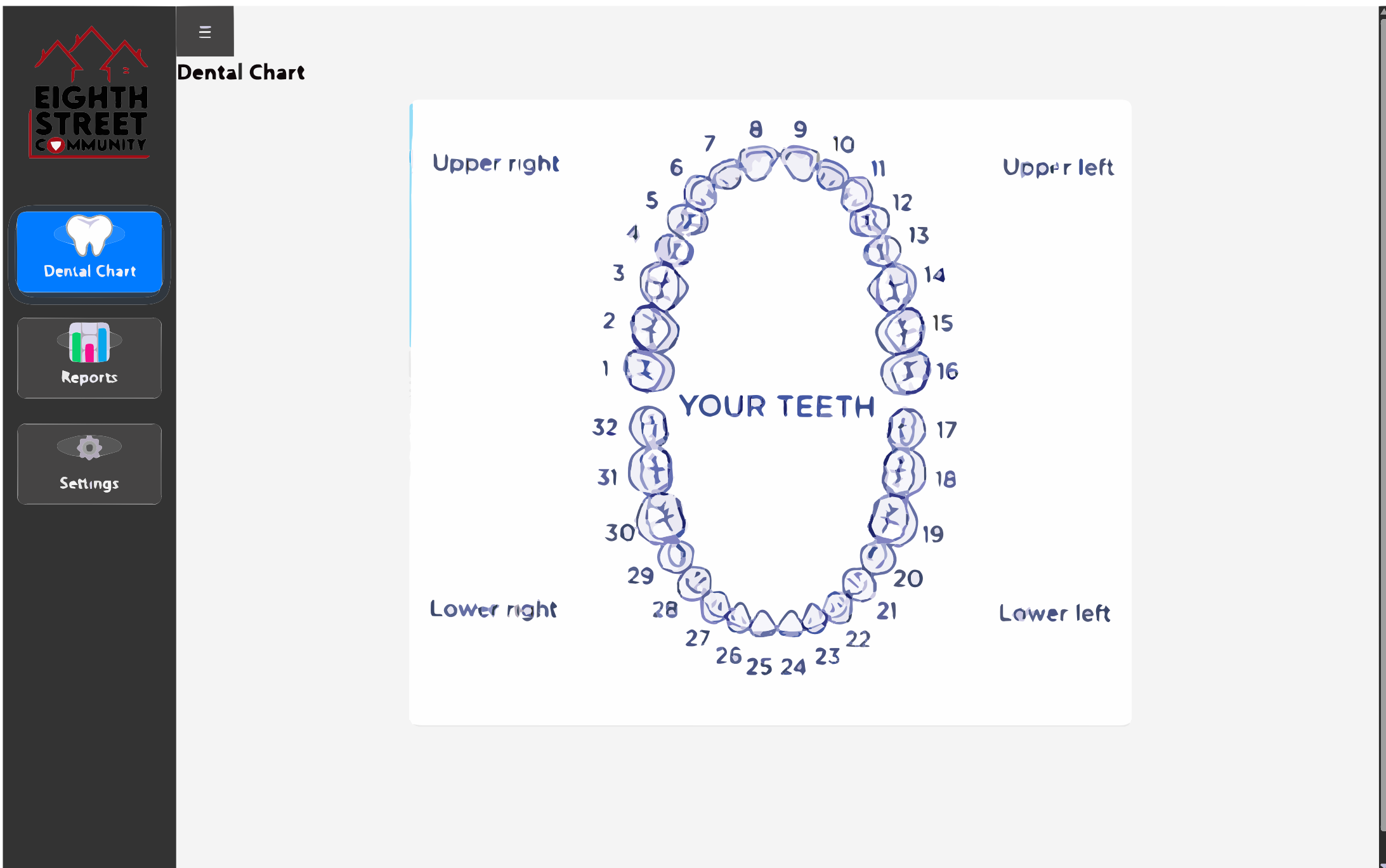
Big Picture

Figures

Time	Roll	Pitch	Yaw	X	Y	Z
0	0.329033	0	0	0	3e-05	0
0.01	0.651328	-0.00365625	0	3.13943e-06	8.99408e-05	2.50664e-06
0.02	0.966883	-0.0108629	0	1.25453e-05	0.000179645	9.98697e-06
0.03	1.2757	-0.0215031	0	3.132e-05	0.000298818	2.48296e-05
0.04	1.57779	-0.0354497	0	6.25289e-05	0.000447049	4.9307e-05
0.05	1.87316	-0.0525665	0	0.000109188	0.000623611	8.55397e-05
0.06	2.16183	-0.0727089	0	0.000174253	0.000828466	0.000135463
0.07	2.4438	-0.0957253	0	0.000260606	0.00106027	0.000200796
0.08	2.71911	-0.121457	0	0.000371047	0.00131836	0.000283016
0.09	2.98777	-0.149739	0	0.000508278	0.00160178	0.000383332
0.1	3.24982	-0.180401	0	0.000674897	0.00190947	0.000502669
0.11	3.5053	-0.21327	0	0.000873387	0.00224028	0.000641651
0.12	3.75422	-0.248164	0	0.0011061	0.00259295	0.000800594
0.13	3.99665	-0.2849	0	0.00137527	0.00296616	0.000979498
0.14	4.23261	-0.323292	0	0.00168296	0.0033585	0.00117805
0.15	4.46216	-0.363146	0	0.0020311	0.00376847	0.00139562
0.16	4.68536	-0.404269	0	0.00242145	0.00419452	0.00163129
0.17	4.90225	-0.446461	0	0.00285562	0.00463502	0.00188384
0.18	5.11289	-0.489522	0	0.00333503	0.00508829	0.00215181
0.19	5.31736	-0.533247	0	0.00386093	0.00555261	0.00243347
0.2	5.51572	-0.577428	0	0.00443438	0.0060262	0.00272688

Acknowledgements

EIGHTH STREET COMMUNITY