

Suzanne Project – Detailed view (v1)

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Requirements:

1. Be able to voice control her adjustable bed

Solution – High Level:

1. We evaluated and tested various solutions that would enable Suzanne to voice control a new bed.

Details of the Solution

1 – Voice Control her bed – It is challenging to understand Suzanne’s voice because of the effects of Cerebral Palsy so trying to come up with a solution that would allow Suzanne to control her bed was not easy and we tried many possible solutions. Add to this, her typical sleeping position eliminated the possibility of using eye gaze to control the bed. Suzanne did not yet have an adjustable bed, so our options on bed technology was not constrained.

Our first observation was that neither Alexa or Google voice training worked with Suzanne’s impaired speech. Also, Suzanne could not dependably get Alexa to respond to any of the wake words. Google’s smart speaker did however wake up to OK Google so we had a starting point.

Since Suzanne did not have an adjustable base, we thought about using an Ergomotion base which is pretty widely used by bed manufacturers including Sealy, Serta, Beautyrest and Tempur Pedic Ergo. There is a model that comes with an offline voice controller which has the added benefit of not being impacted by WiFi/Internet outages. We shipped Suzanne the components from our lab which included an Ergomotion voice module, control box and actuator so she could test their solution without having to buy a bed. The initial results were not great. Much like the Alexa smart speaker, the Ergomotion voice module did not reliably respond to the wake word. Suzanne’s voice has been heavily impacted by her disease.

So, we went to plan B. The Ergomotion base has an option for a WiFi dongle which is supported by Alexa and Google. The Ergomotion “skills” are implemented very differently for Alexa vs Google. The Alexa skill is pretty straight forward which makes it very easy to create “Routines” in the Alexa app to simplify bed commands. The Ergomotion “Google skill” is implemented in a way that precludes the possibility of using “Google Routines”, so no way to create simpler bed command on Google for the WiFi dongle. The net result was that we had to eliminate the Ergomotion WiFi dongle as a possible solution because of two reasons. We could not use Alexa with the WiFi dongle because of the already described

issue with the wake words not being understood, and using Google with the WiFi dongle was eliminated because the way the “Google Skill” is implemented.

The best solution we could come up with was a combination of Google and the offline Ergomotion voice module. I realize this might sound a bit convoluted, but this approach allowed us to use the advantages of Google’s ability to understand the wake word and give us the ability to create simpler commands using Routines. From there we had to get creative and discover what “4 words” would Google best understand from Suzanne and then associate each of those 4 words with functions in the bed. So, to give an example, when Suzanne says “Hey Google, Blue”, Google will hear this and execute the routine for the word “Blue” which will result in the Google Mini speaking the real command to the Ergomotion Voice module, and the bed moves as intended.

Resources

[Google Home getting started](#)

[Google Home Help Forum](#)

[Google Home Support](#) Phone number for Google Home hardware support = 855-971-9121 (24/7 days a week)