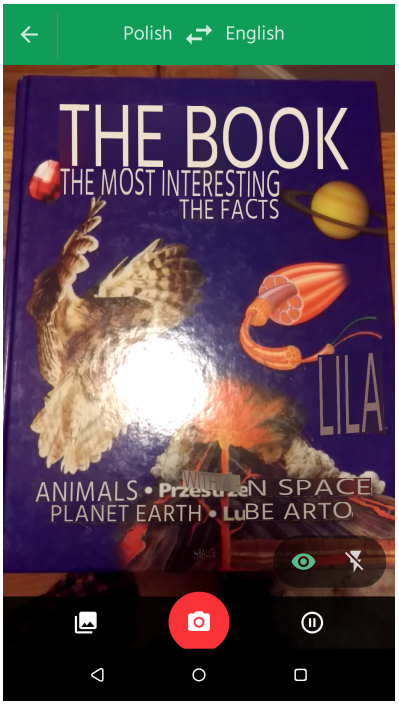
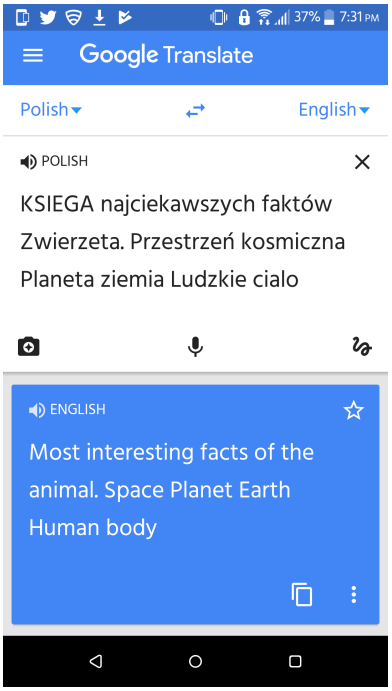
As a bilingual, speaking both English and Polish, I wanted to use items that had text written in the Polish language since I could easily confirm if the text is correct or not. My mom has a great book selection of polish books and polish products at her house that were the perfect candidates. I also wanted to test something in a language I don't speak well, but something that I knew the translation of for reference, to test thow well it translates.

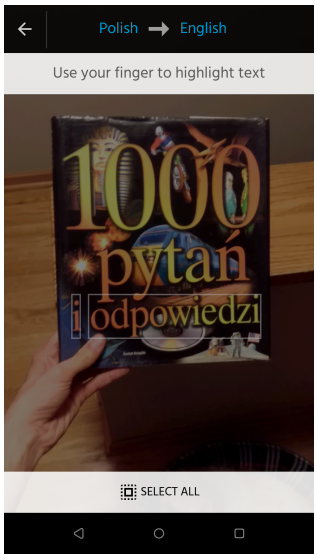
**Book testing**

I went through about 5 different book covers, with mixed results. It seems that books that have the simplest cover, where the text is one basic color, it gets the translation pretty much spot on.
This was one of the better results,even if it did try to space out the title :

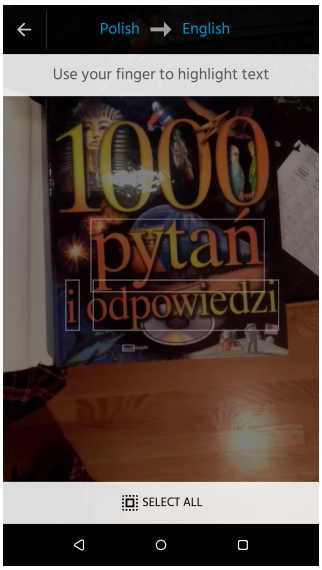



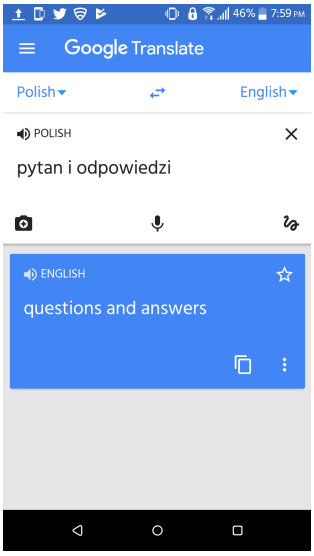




This case was basically word for word correct other than some spacing issues due to it not seeing the dots separating the words. While on the other side , giving an awful translation, was a book that had simple title ( "1000 questions and answers" ). On the 4th location ( bedroom, 2 lamps and main light turned on ) making sure no shadows were in the way, and being at a very specific distance it gave me the correct result.





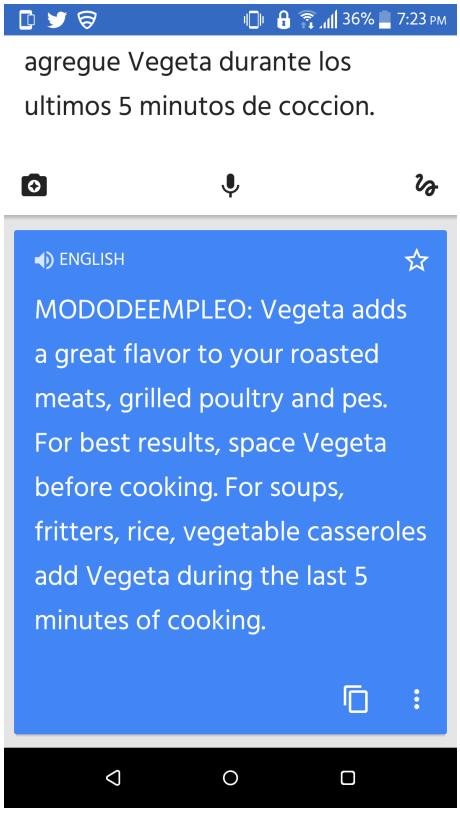


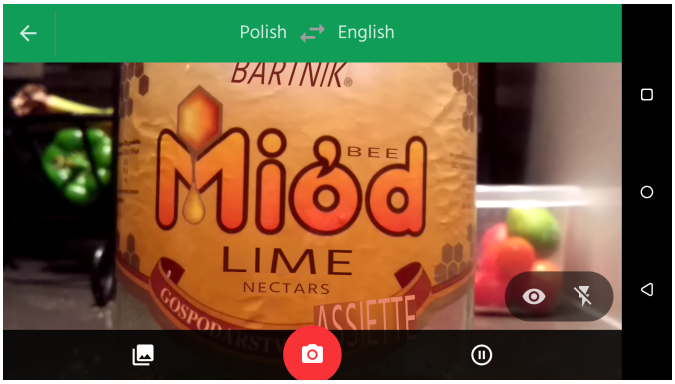
**Grocery items test**

The next test I wanted to conduct was with grocery items that were also in the house. Main focus was a Polish jar of honey, and then a Spanish seasoning can, which had the English translation above it for comparison. I chose these out of a few different ones since this difference was very apparent.
What I had seen earlier, holds true here as well, the more complicated the label, the less clear the translation. New lesson I learned here, was that if you want it to translate in real time a large amount of text, it'll basically become unreadable, which I see this being the limitations of this application's reality augmentations. It still did a great job of getting a precise translation from what it was, so the translation part did a pretty good job, but the real time translation struggled with the wall of text, since it also tried to translate the English portion as well.

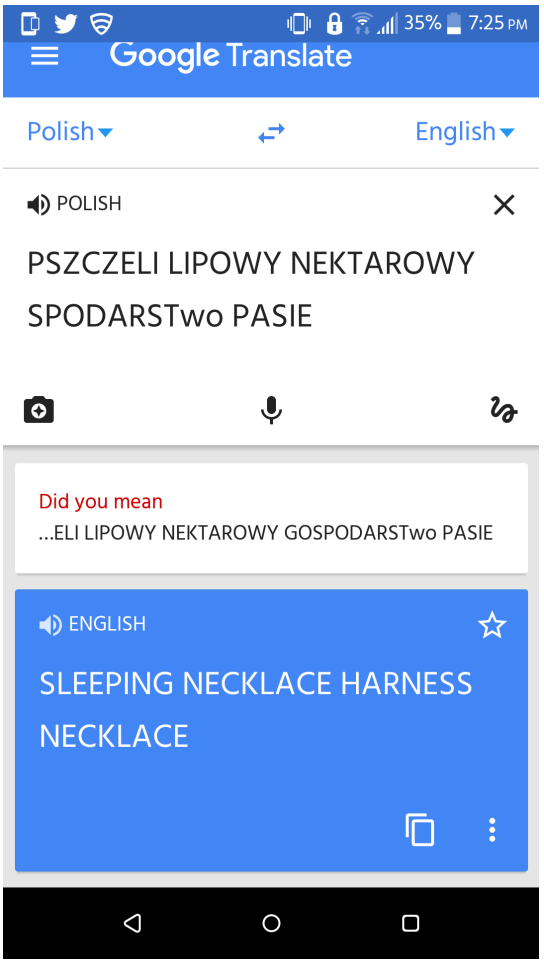




The last item is the jar of honey mentioned previous, which was the most complex label I could find. And the translation that came out was pretty off what is was suppse to be , other than it getting the word “BEE” , which is close to the translation, where the correct translation should be “Bee’s Honey” rather than Bee Honey.





**Conclusion/Answers**

After doing this testing, and playing around with the tool on the blue line, I have realized the possibility of this tool can be great, but may be limited by many factors. While the train moved, it was hard for the text to keep steady, and it was hard to tell if the translation was correct ( no images were taken )

If a user wanted to have glasses/contacts that could translate in real time, they would require hardware and software to be superior to my smart phone, as in the current state it might become quite dizzying/confusing when the words are constantly switching sizes / orientation / meaning all at once.

Being augmented reality, I would see great benefit of when a person is traveling abroad to be able to translate shops, menus, bus stops etc. in real time. This is especially useful when going to countries that use either mandarin, the Greek alphabet, etc. since typing out their alphabets might prove difficult, while the Google translate system can take care of figuring out the words with minimal user input. The user would probably want to have fine control of when and what to translate, as for it not become over baring, and from a software engineering point of view this shouldn't be too hard to implement.

I can't think of a great solution that would avoid the issues I experienced, since if you don't translate certain phrases together, they can loose their meaning. So having something implemented that the user can read a translation in augmented reality one word at a time, without the whole text changing would be beneficial, but it would need to retain the original message.

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Overall, great tool, I will probably use it myself when I have a hard time translating, since it's much faster than trying to type out what might be foreign words, and the fact it doesn't need constant Internet connection ( you can download language packs ) is a great benefit to people that do travel abroad and might be in rural places without Internet.