LookHere - Final Presentation

An Auxiliary Application based on Interactive Picture Exchange Communication System (PECS)

Shanjie Chen (Kevin), Yang Qiu (David), Zhuoyang Fu (Jeffery), Zixuan Liu (Justin)

Outline

- Highlight - David
- Technical Highlight - Kevin
- Design & Literature - Justin
- Reflection - Jeffery

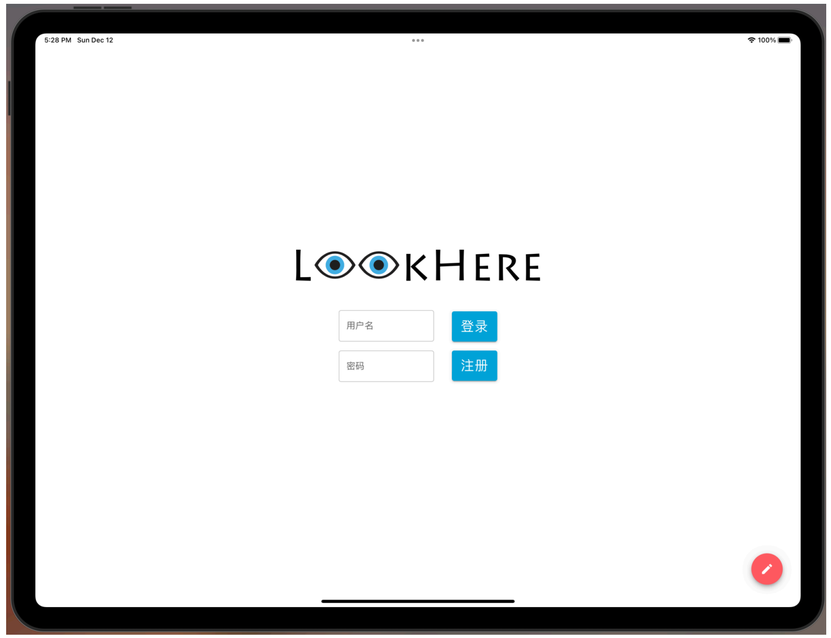
Highlights

Cross-Platform

- Our Application supports:
  - IOS: iPhone, iPad
  - Android: Huawei, Samsung, Pixel

Iphone 13
ios 15.0

Pixel 4
Android 11



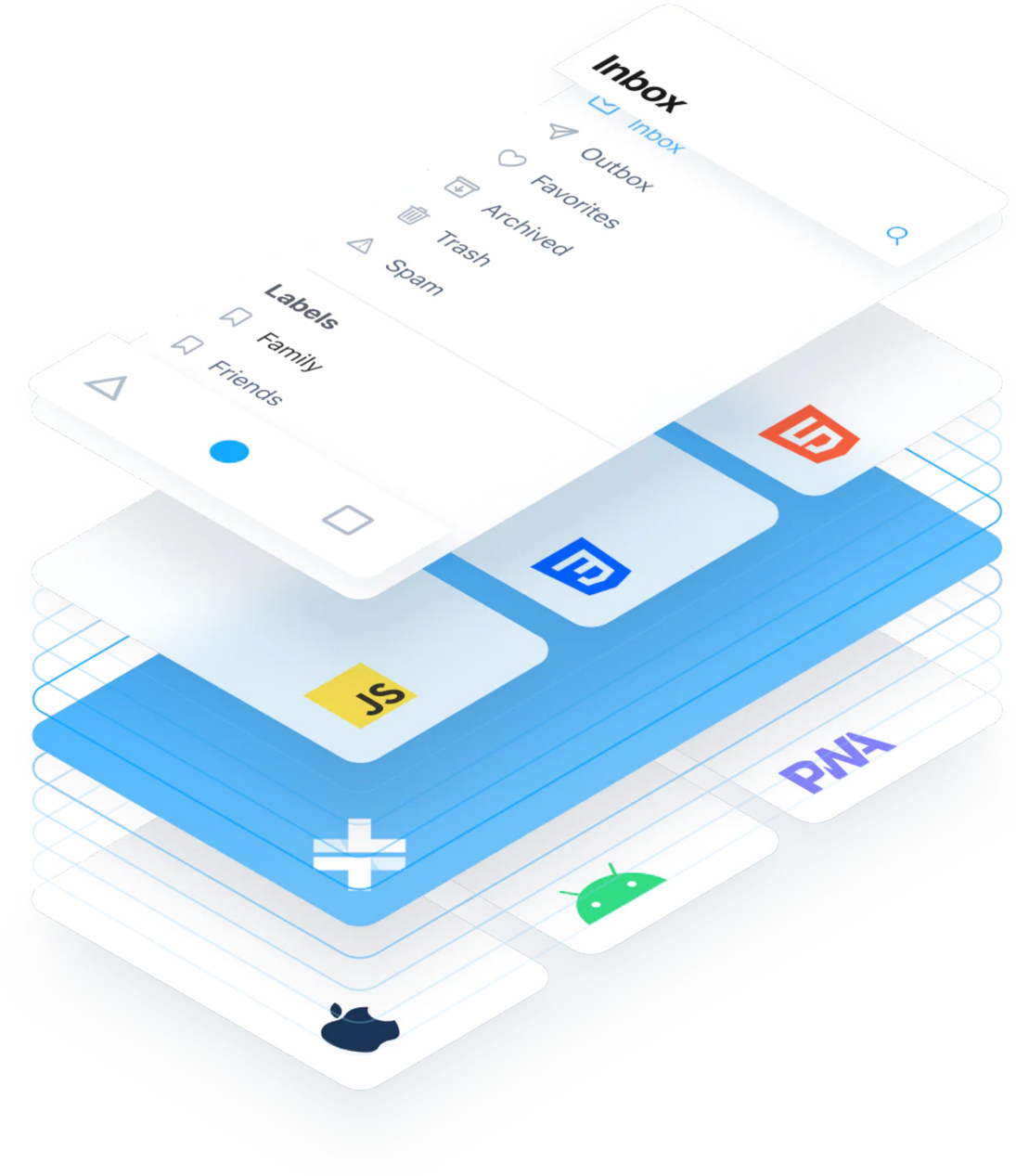
Ipad Pro
ios 15.0

Capacitor

- Capacitor:

  an open source native runtime for building **Web Native apps**. Create cross-platform iOS, Android, and Progressive Web Apps with JavaScript, HTML, and CSS.

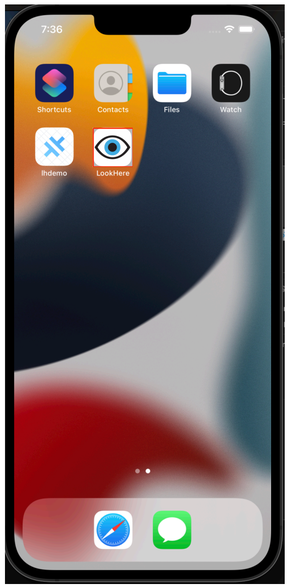
- *Future work, such as the portability of the facial detection module on different platforms and on different devices is needed. (Kinane. 2018)[8]*



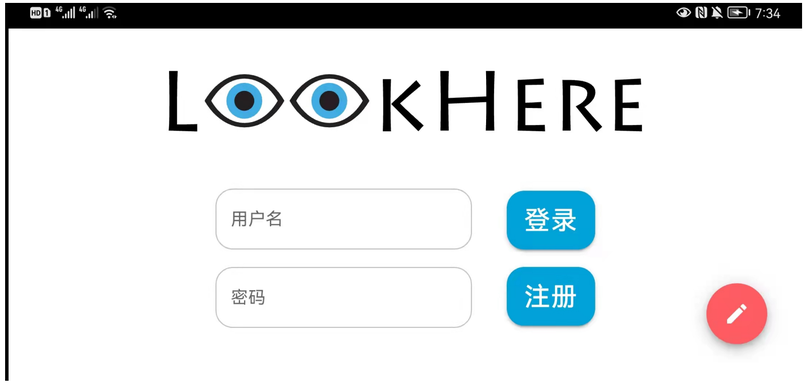
One More Thing

Auxiliary Orientation

- Operation Tips



把屏幕横过来哦



- Haptic feedback

Technical Highlights

Data Organization

CDN: Saving Costs

Object Storage Pricing - Tencent Cloud

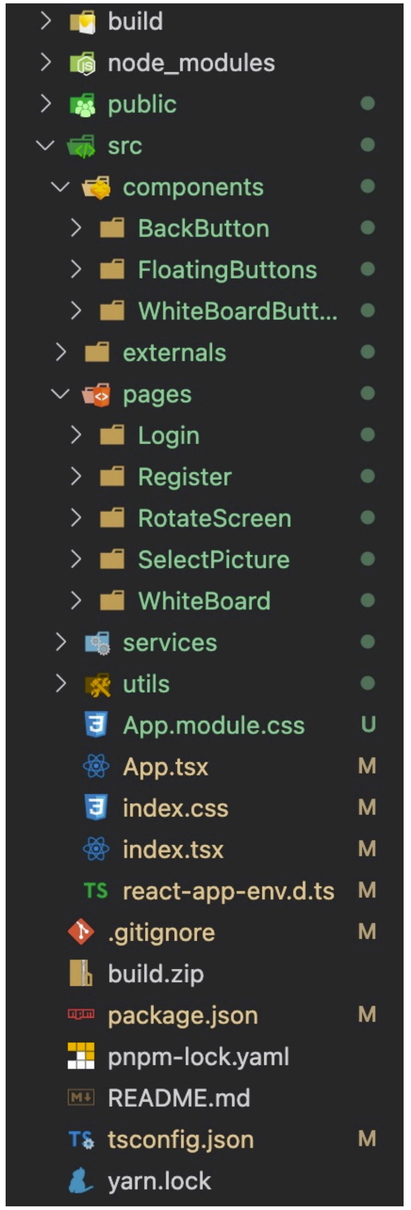
Region	Outbound Traffic (yuan/GB)
Chengdu, Chongqing, Beijing 1, Beijing, Nanjing, Shanghai, Guangzhou	0.5
Beijing Finance, Shanghai Finance, Shenzhen Finance	0.8
Hong Kong, Mumbai, Jakarta, Tokyo, Frankfurt, Sao Paulo	0.75
Singapore, Silicon Valley, Virginia, Moscow	0.5
Seoul, Bangkok	0.9
Toronto	0.45

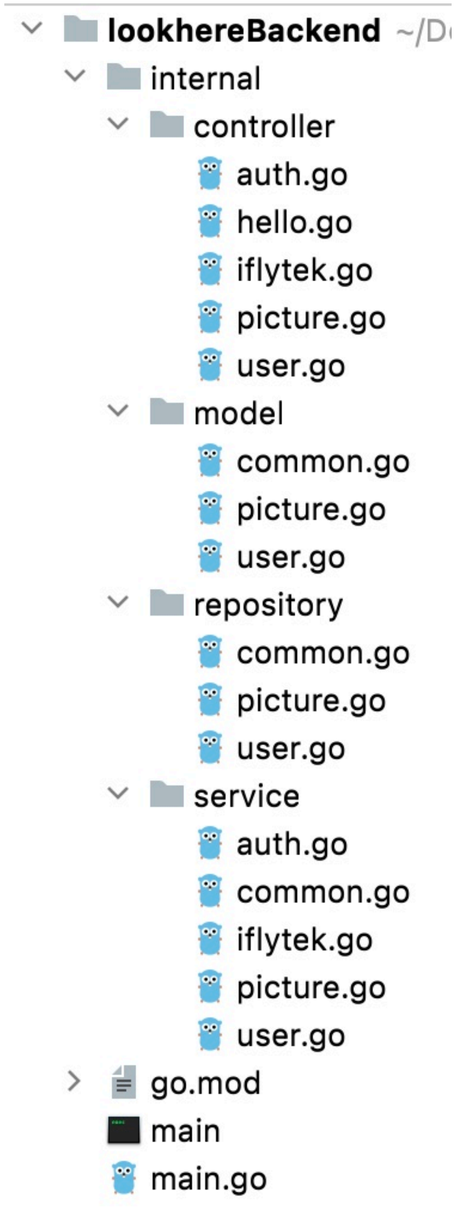
CDN Pricing - Tencent Cloud

Traffic/Region	CN	NA	EU	AP1	AP2	AP3	ME	AA	SA
0TB - 2TB	0.21	0.31	0.31	0.46	0.55	0.63	0.9	0.68	0.68
2TB - 10TB	0.2	0.26	0.26	0.41	0.51	0.6	0.83	0.64	0.64
10TB - 50TB	0.18	0.22	0.22	0.37	0.47	0.57	0.77	0.6	0.6
50TB - 100TB	0.15	0.18	0.18	0.33	0.41	0.53	0.71	0.56	0.56
≥ 100TB	0.11	0.14	0.14	0.31	0.35	0.46	0.65	0.52	0.52

Code Organization

- Clear directory structure
- Rational layer
- Abstraction & encapsulation
- Good readability
- High maintainability





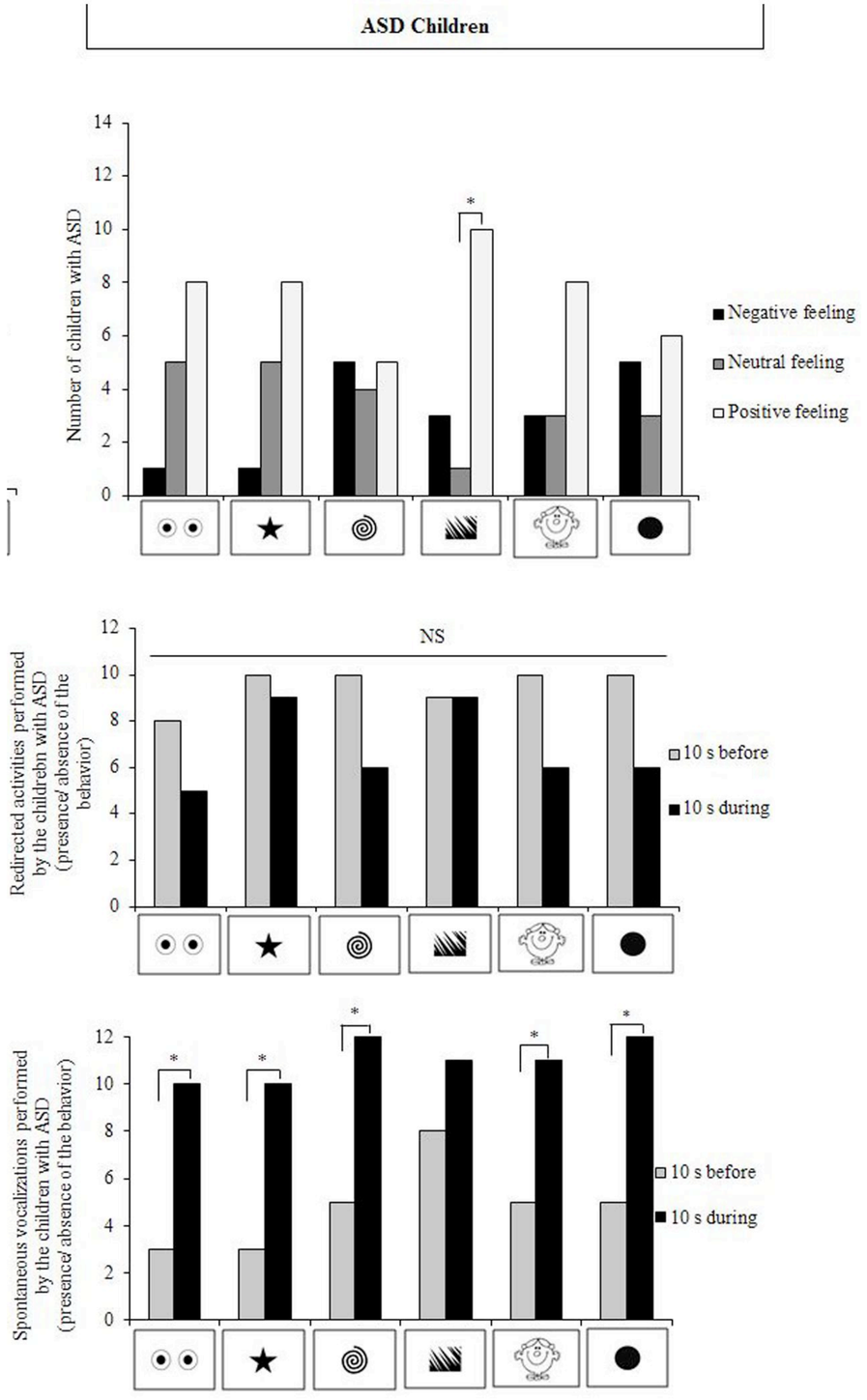
Other minor technical highlights

- Data loading indication
- Separated parents and ASD children account, and easy access
- Play the audio anytime the ASD children want
- Manage pictures easily

Design & Literature

UX Design

- Neurotypical children perceived the spiral stimulus positively (i.e., a curvilinear shape) whereas children with ASD perceived the jagged edges stimulus positively (i.e., an angular shape). (Laurine Belin et al. 2017) [1]
- Mazefsky and White (2014) proposed that emotion regulation of people with ASD could be inherently disrupted so as to elicit aberrant behavior in highly emotional situations (Konstantareas and Stewart, 2006). [2]
- Solution: Avoid high stimulus; let ASD children concentrate



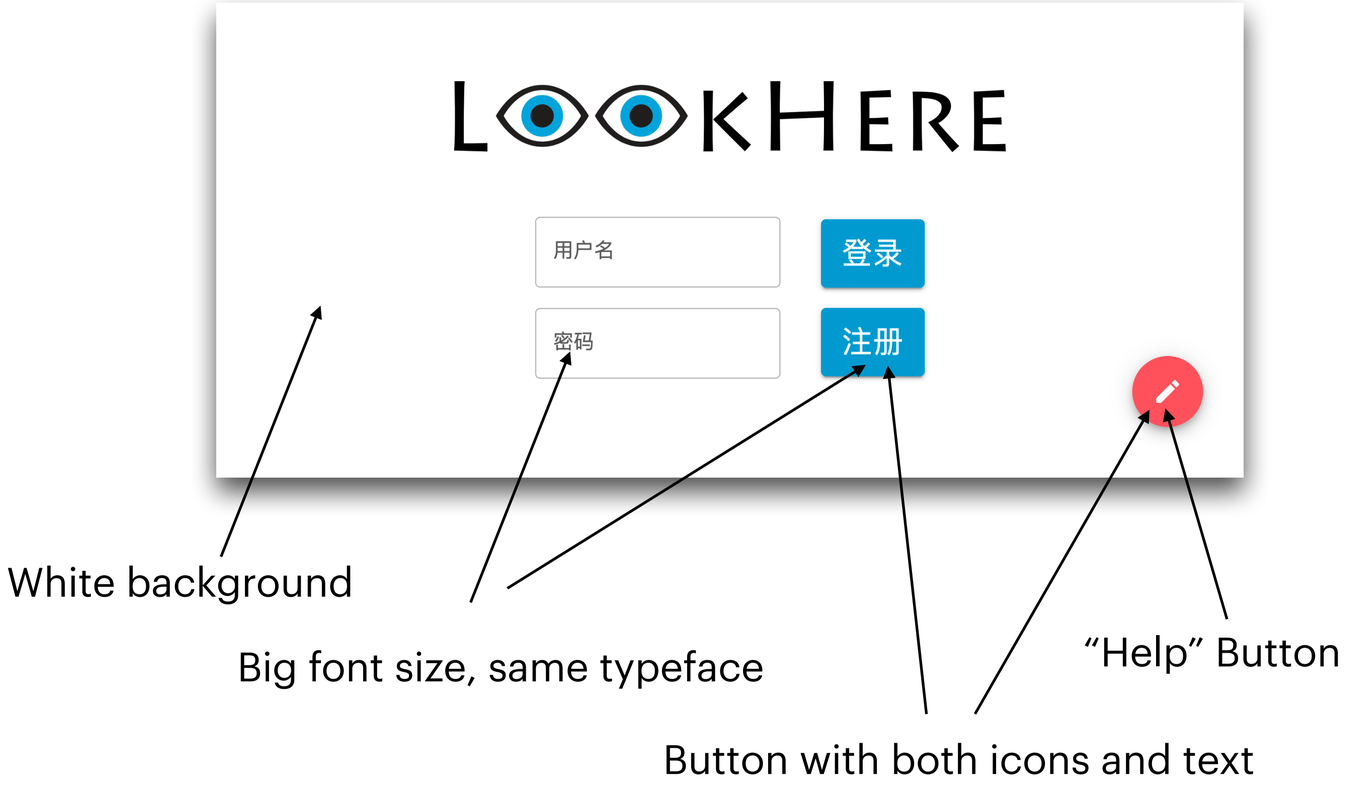
Rounded Rectangle

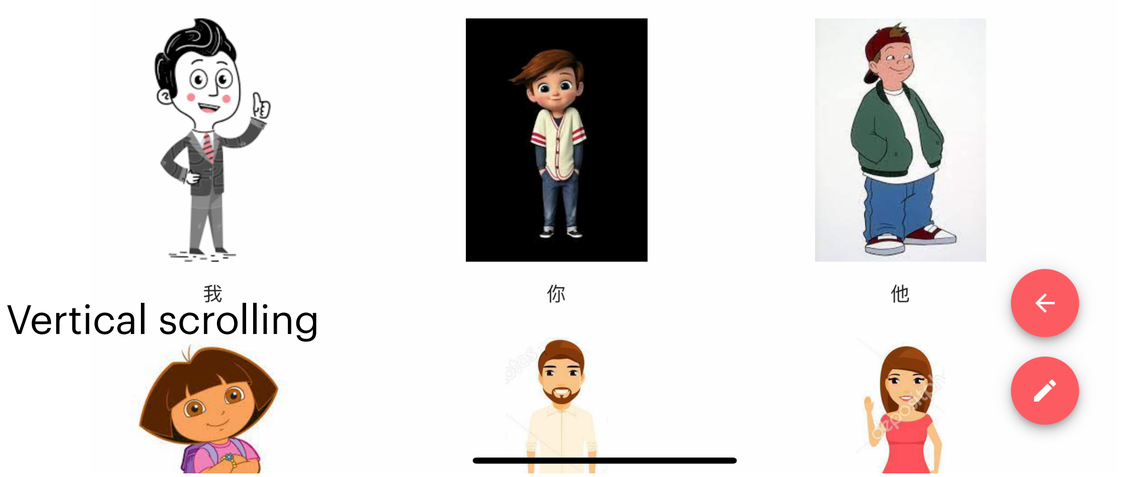
Before

After

Less is more

- Each sentence must be short as possible— more than 15 words are harder to read.
- Never use a picture as background for the text.
- Use a maximum of two typefaces.
- Do not use pop-up elements and distractions.
- Do not have horizontal scrolling.
- Strive for simple, clear navigation.
- Have a Help button.
- Words must be big—a font size of at least 14 point is good.
- Design for simplicity and few elements on screen.
- Use clear, large buttons with both icons and text.
- … (Nikolay Pavlov, 2014) [3]





Color

- Marine Grandgeorge and Nobuo Masataka investigated the preference of ASD children and TD children for six colors: red, pink, yellow, brown, green, and blue, in clinical settings.[4]
- “When mean rank of preference was computed in each of the ASD and TD groups with regard to each color, it was found that boys with ASD were significantly less likely than TD boys to prefer yellow and more likely than TD boys to prefer green and brown colors.” (Grandgeorge M and Masataka N (2016))[4]

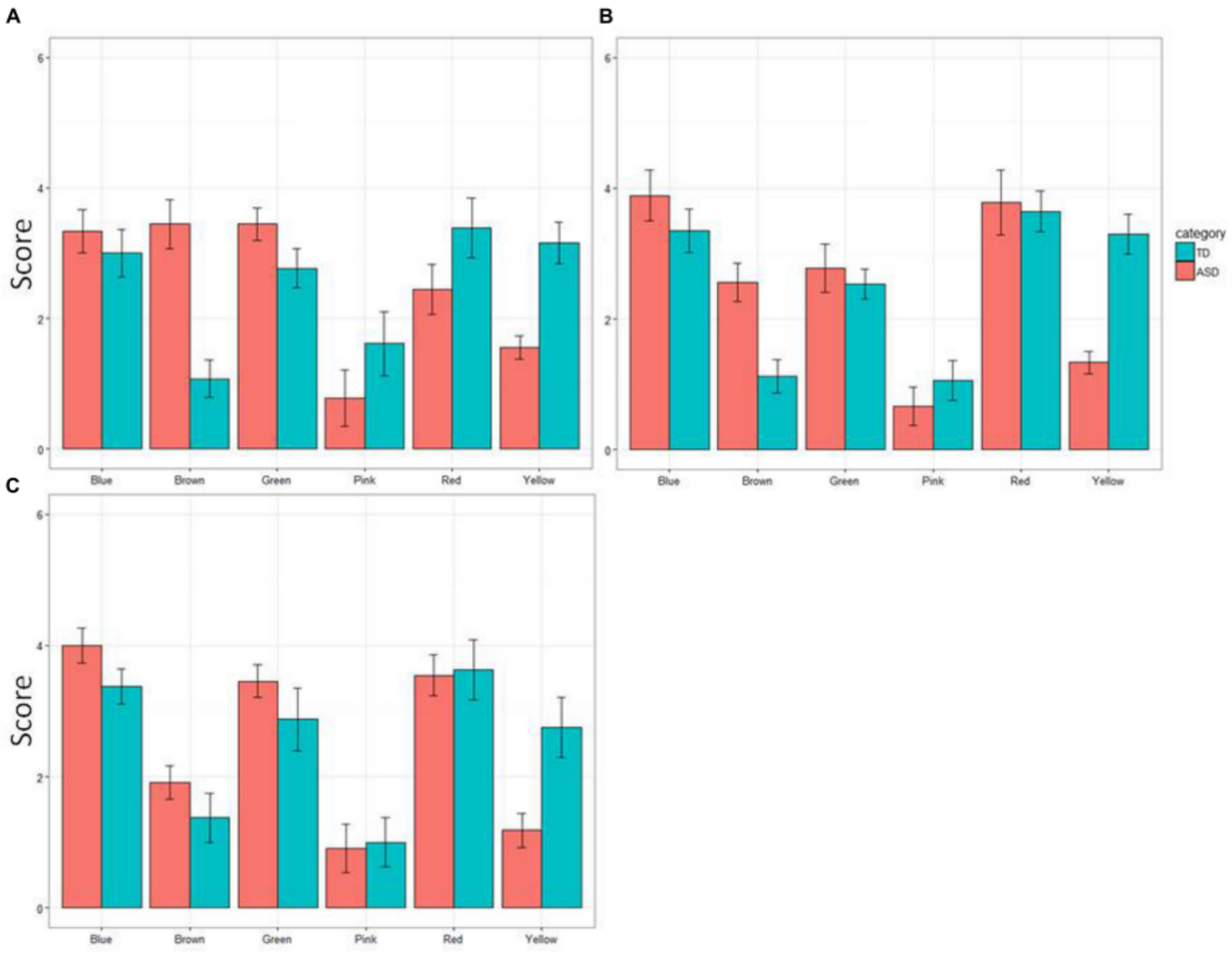


FIGURE 1 | Mean preference scores (error bars: SDs) of six colors in children with autism spectrum disorder (ASD) and in typically developing (TD) children. (A) 4- to 7-year-olds, **(B)** 8- to 10-year-olds, and **(C)** 11- to 17-year-olds.

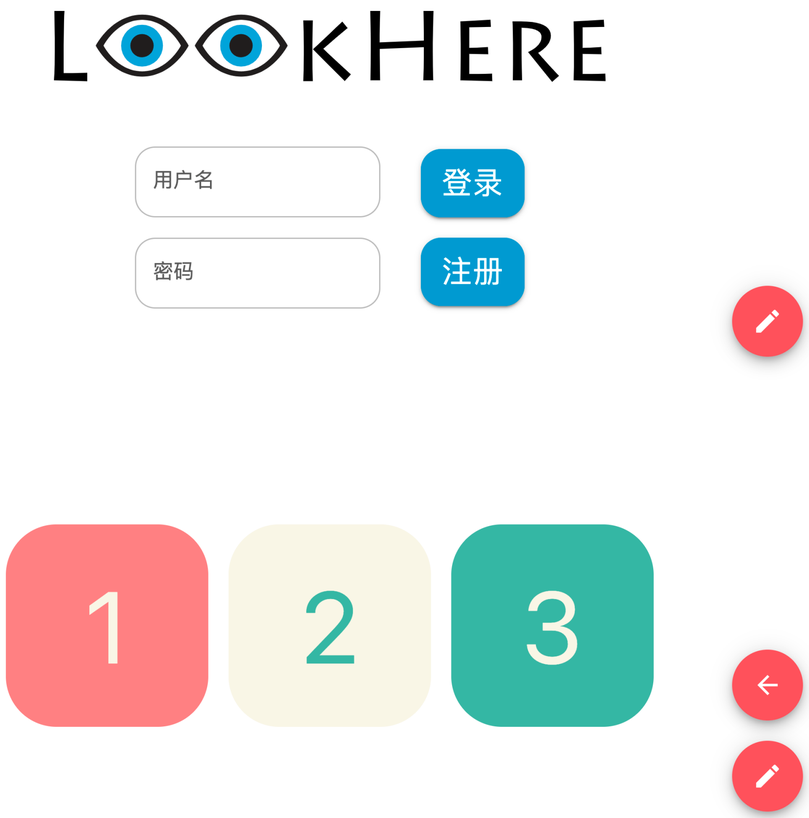
Only Use 5 Colors

Black, Blue, Soft Red, Green, White

One More Thing

Auxiliary： Color Blind Concern

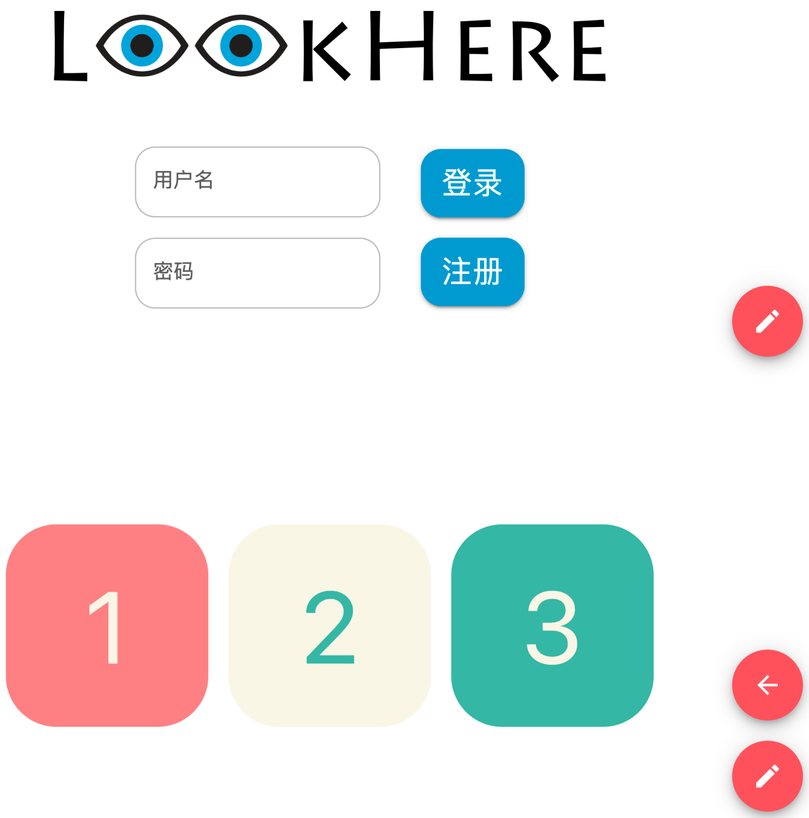
Normal View



Red Color Blind View

Auxiliary： Color Blind Concern

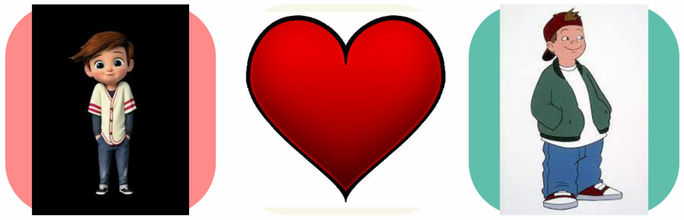
Normal View



Green Color Blind View

TTS(Text To Voice)

- Using a speaker that the children have not heard before could have created more interest for the ASD group and motivated them to interact with the key pad. (Lynn Gilbertson, 2017) [5]
- We use iFLYTEK API to convert the text to audio.



你喜欢他

Image

- ASD children show an atypical preference for non-social stimuli.(Gale, Catherine M., et al, 2019)[6]
- Children with ASD who have the highest interest in non-social reinforcers are typically children, and later adolescents, with fewer skills. Therefore, these individuals may, in the long-term, be unable to function in society or have any form of independence.(Gale, Catherine M., et al, 2019)[6]
- Consideration should be given to developing procedures that reduce the reinforcing power of some non-social stimuli. [6][7]

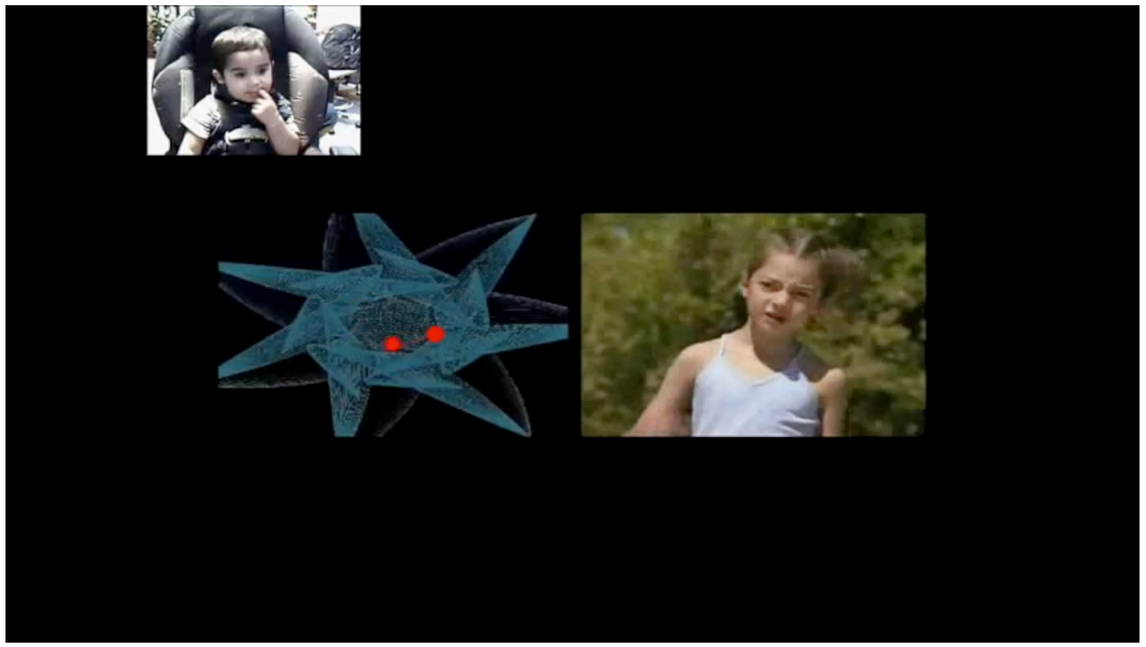
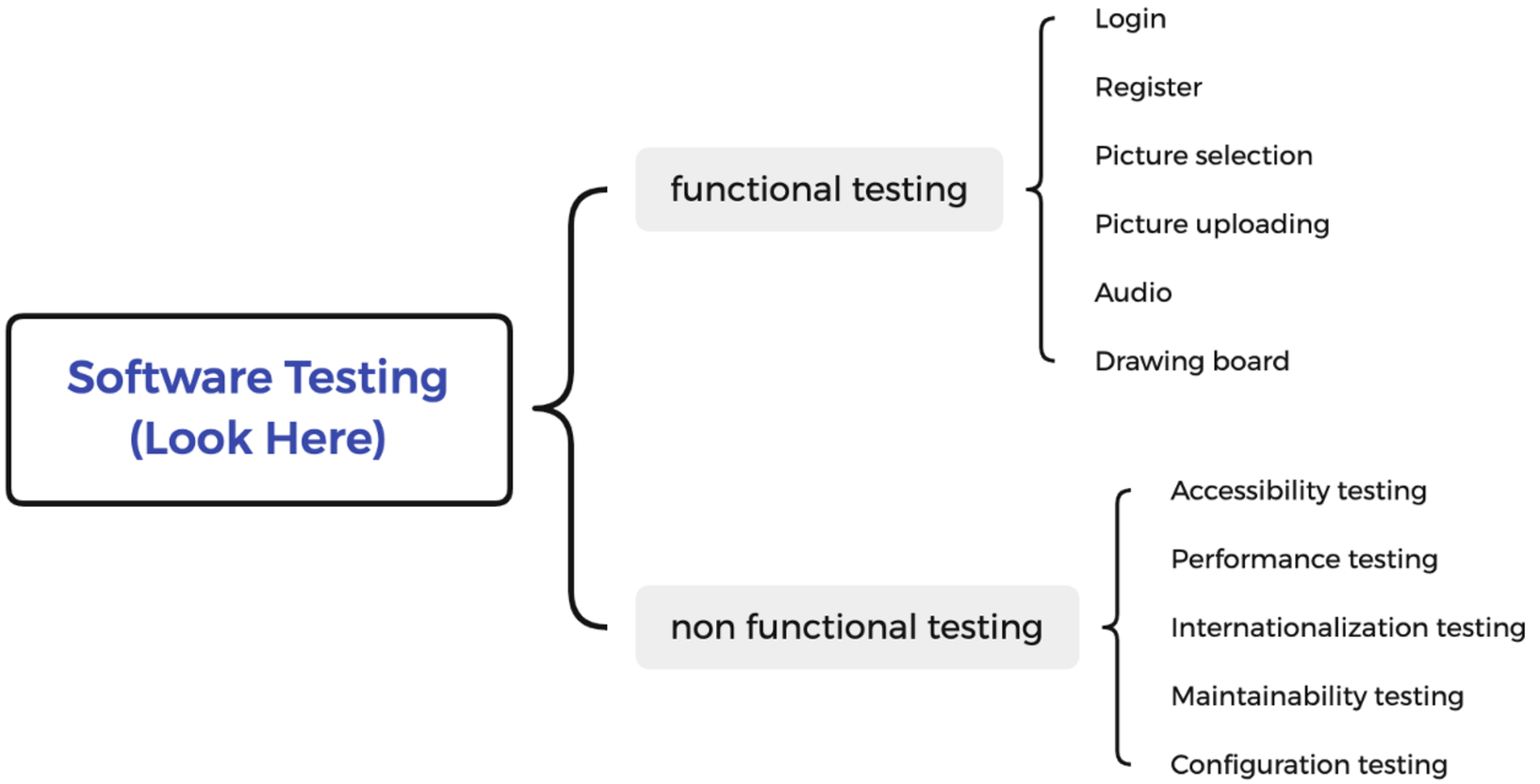


Image Selection

Reflection

Software Testing



Functional Testing

- Login & Register
  - Check whether the “login” and “register” function can connect the frontend with the backend.
- Picture Selection
  - Check whether the three area can select the correct picture and show the clear and entire graph.
- Picture Uploading
  - Check whether user can upload the new pictures.
- Audio
  - Check whether the IFLYLEK API can transfer text to audio smoothly.
- Drawing Board
  - Check whether the drawing board can be written or drew.

Nonfunctional Testing

- Accessibility testing
  - Check how the application can be used with disabilities – ASD
- Performance testing
  - Check the reaction speed and responsiveness of our application under various environments
- Maintainability testing
  - Check our app’s ability to update, such as database
- Configuration testing
  - Test an app against various software and hardware variations (different phones)
- Internationalization testing
  - Test if our app can adapt to regional languages and other factors

One More Thing

LookHere (V1.0) Standard Compatibility testing report

Testing tool: Tencent - WeTest

LookHere(1.0)标准标准兼容测试(Android)报告							
	App名称:	LookHere	测试类型:	标准兼容测试（Android）	测试设备数量:	48	开始时间:	2021-12-12 16:23:27
	版本号:	1.0	脚本名称:	/	设备通过率:	97.92%	结束时间:	2021-12-12 16:35:20

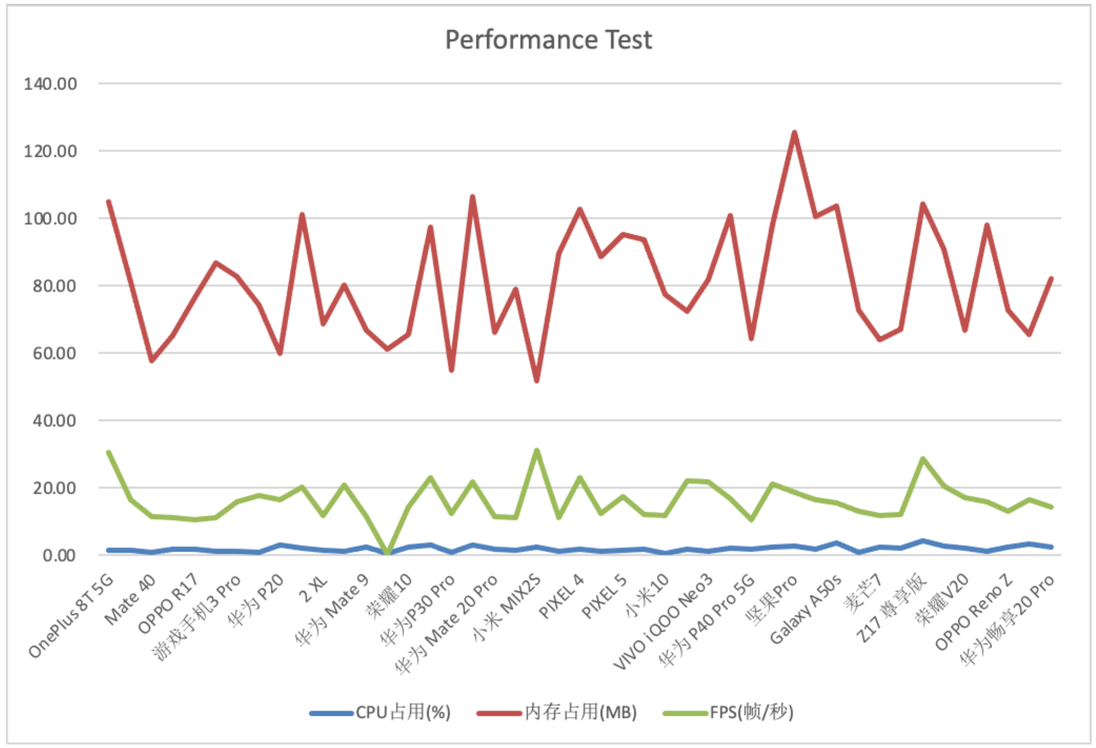
测试结果								
设备通过率	本轮测试，提测设备共计 48 部，完成 48 部（未测试 0 部），问题机型共计 1 部，通过率 97.92%							
97.92%	共发现问题总数 1 个							
适配分布	测试设备数量	测试结果百分比		发现问题类型	问题数量	测试结果百分比		
通过	47	97.92%		App启动失败	1	100.00%		
未通过	1	2.08%						
未测试	0	0.00%						

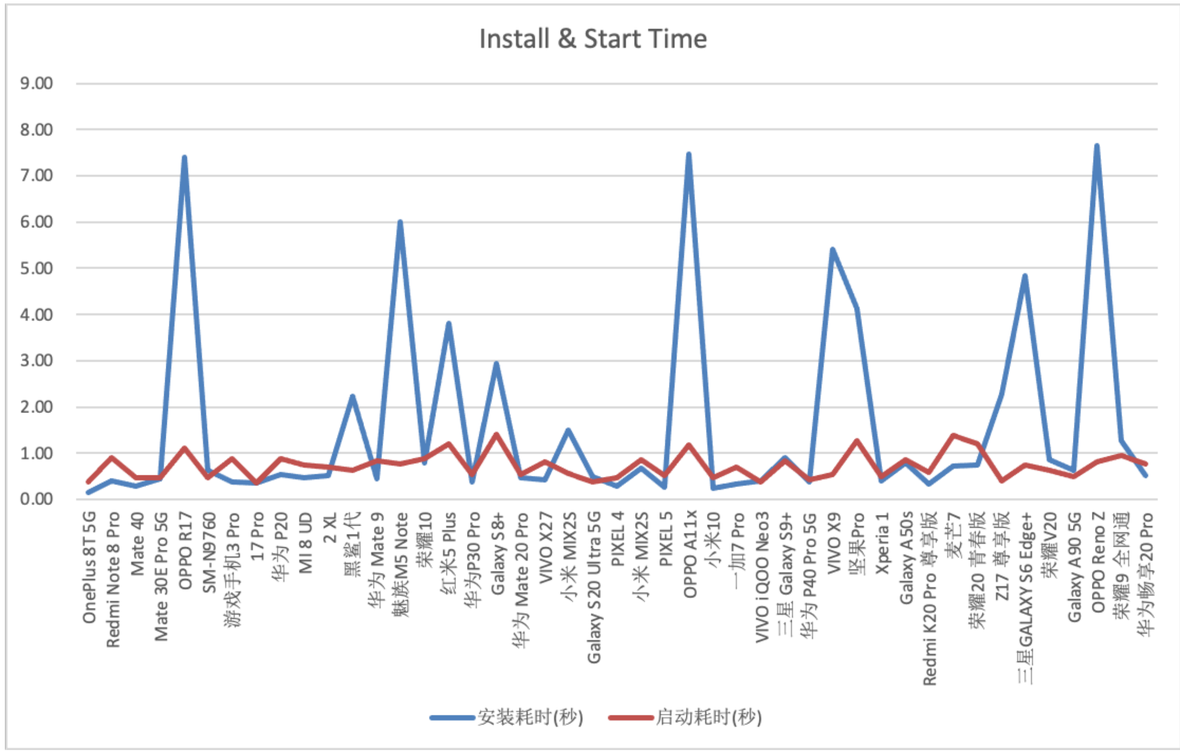
问题列表			
问题类别	问题描述	涵盖设备	操作
App启动失败	com.lookhere.app error:Error: Activity class {com.lookhere.app/com.lookhere.app.MainActivity} do	1台 | OPPO A37m/A37m	121200317305/problem/111?errorid=194

- In the report, we can also check the compatible. failed device distribution and performance report

Performance Report

LookHere (V1.0)





Limitation & Future Work

- Limitation
  - User can only choose three pictures so that their expression may not accurate.
- Future Work
  - Improve the functionality of the “Picture Selection”
  - Implement the “ASD Detection” by reading data from the backend database
  - Observe the social dependence of ASD children after using our application
  - Observe the times the ASD children do not concentrate on the main tasks and analyze the possible factors.

References

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- [8]Daouadji Amina, Kinane, and Bendella Fatima. "MEDIUS: A serious game for autistic children based on decision system." Simulation & Gaming 49.4 (2018): 423-440.
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- [14]Fuentes, Christina T., Stewart H. Mostofsky, and Amy J. Bastian. "Children with autism show specific handwriting impairments." *Neurology* 73.19 (2009): 1532-1537.

Thanks for Listening