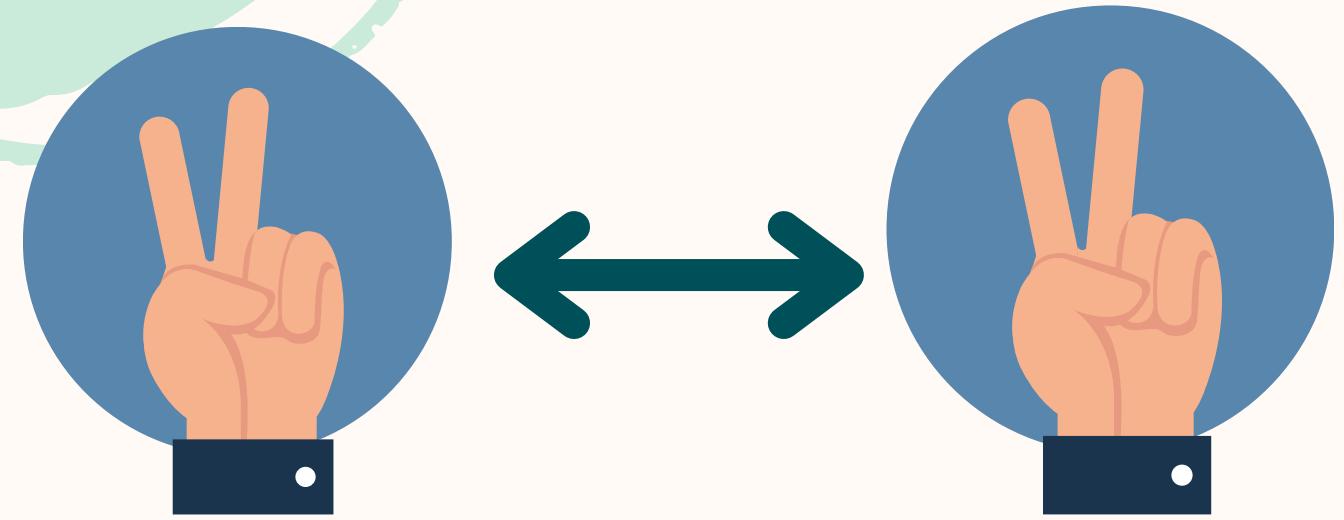




CRT AVP Project

- 微血管繼續種植計畫 -

What is CRT?



Capillary Refill Time (CRT)

為衡量遠端微血管床施加外力使皮膚變白後恢復原本膚色所需的时间，藉以評估末梢循環狀況。

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3862738/>

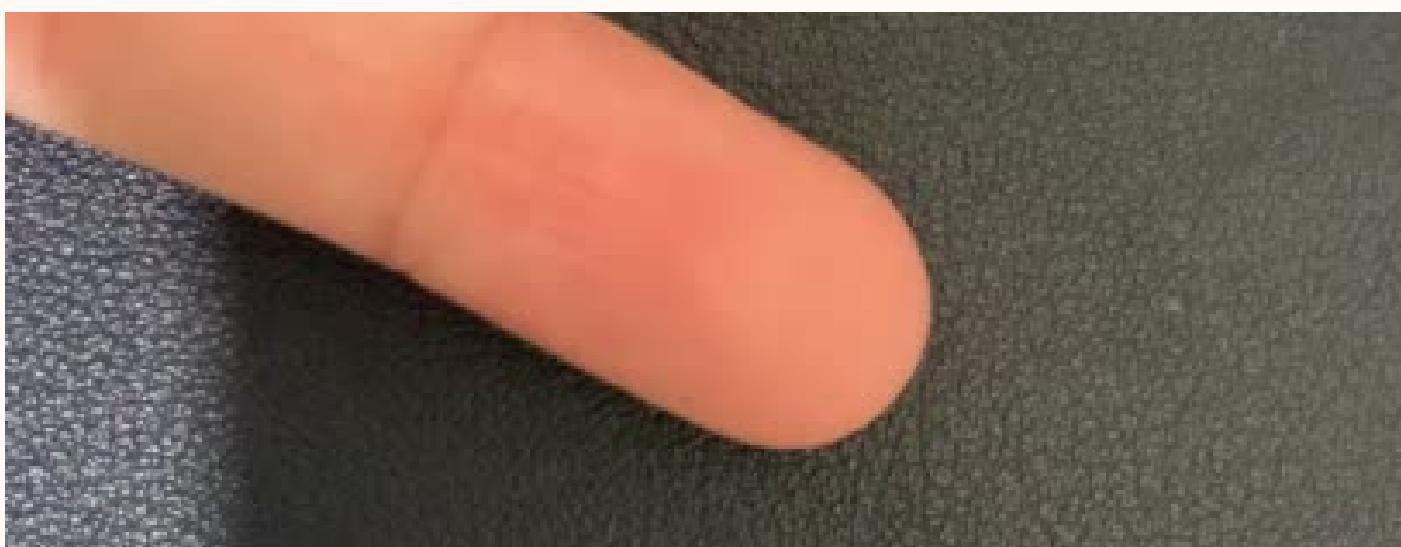
When

急診、新生兒評估

CRT是臨床心肺循環評估的重要指標

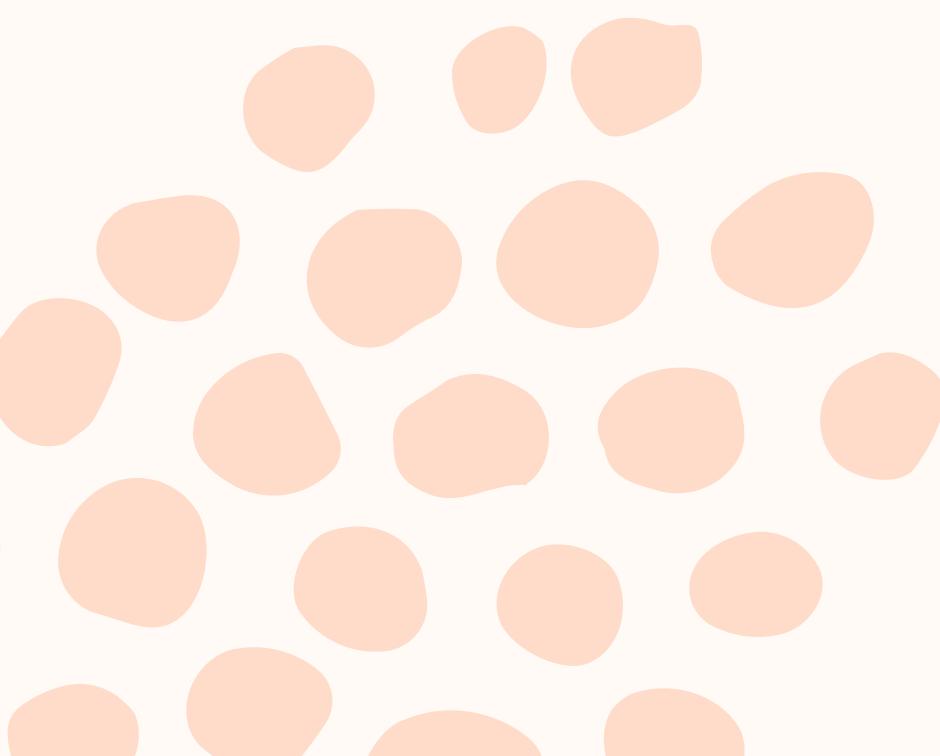
How

文獻指出，
CRT小於2秒均屬正常健康人。





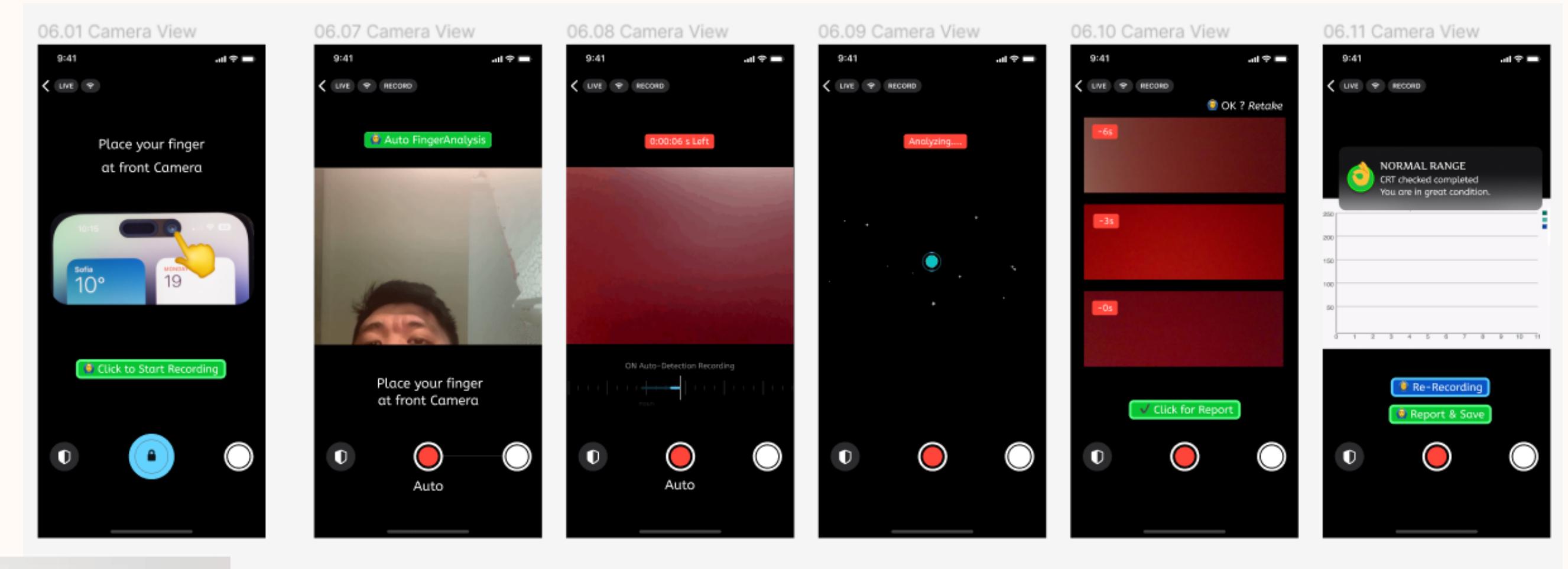
Front End



Figma



- 前端手機樣態已做出(利用Figma)
- 可掃畫面看Demo



FIGMA



- 完成大致Flutter Code
- 遇到問題

1. Compile to Web Fail
2. 手指遮擋光源太嚴重

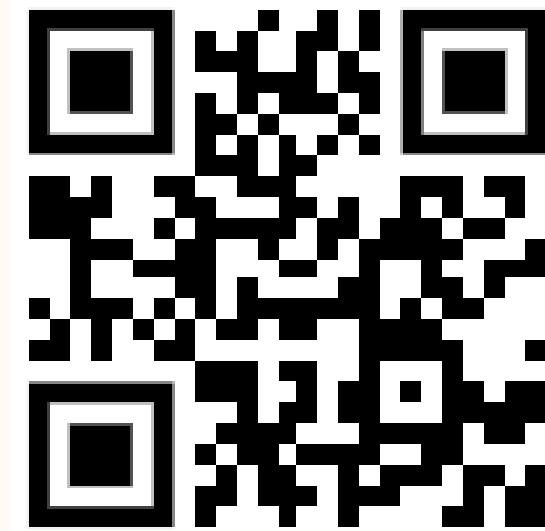
The screenshot shows the FlutLab IDE interface. The top bar displays the title "Stateful Click Counter". The left sidebar contains an "Explorer" panel showing the project structure, including "main.dart" under "lib". The main area shows the "main.dart" code:

```
161   |       width: 2,
162   |   ), // Border.all
163   |   borderRadius:
164   |   |   BorderRadius.all(Radius.elliptical(40, 40)),
165   |   |   |   ), // BoxDecoration // Container
166   |   |   |   ],
167   |   |   |   ],
168   |   |   |   ],
169   |   |   |   Positioned(
170   |   |   |   |   top: 544,
171   |   |   |   |   left: 103,
172   |   |   |   |   child: Text(
173   |   |   |   |   |   'Place your finger',
174   |   |   |   |   |   textAlign: TextAlign.center,
175   |   |   |   |   |   style: TextStyle(
```

Below the code editor, there is a "Build" tab in the bottom navigation bar. The "Outputs" section shows several error messages:

- entrypoint/main is _UnaryFunction
- .dart_tool/flutter_build/f25c52552afad38f150965f830922262/main.dart:16:28:
Error: Undefined name 'main'.
return (entrypoint.main as _UnaryFunction)(<String>[]);
^^^^^
- .dart_tool/flutter_build/f25c52552afad38f150965f830922262/main.dart:18:26:
Error: Undefined name 'main'.
return (entrypoint.main as _NullaryFunction)();
^^^^^
- Error: Compilation failed.

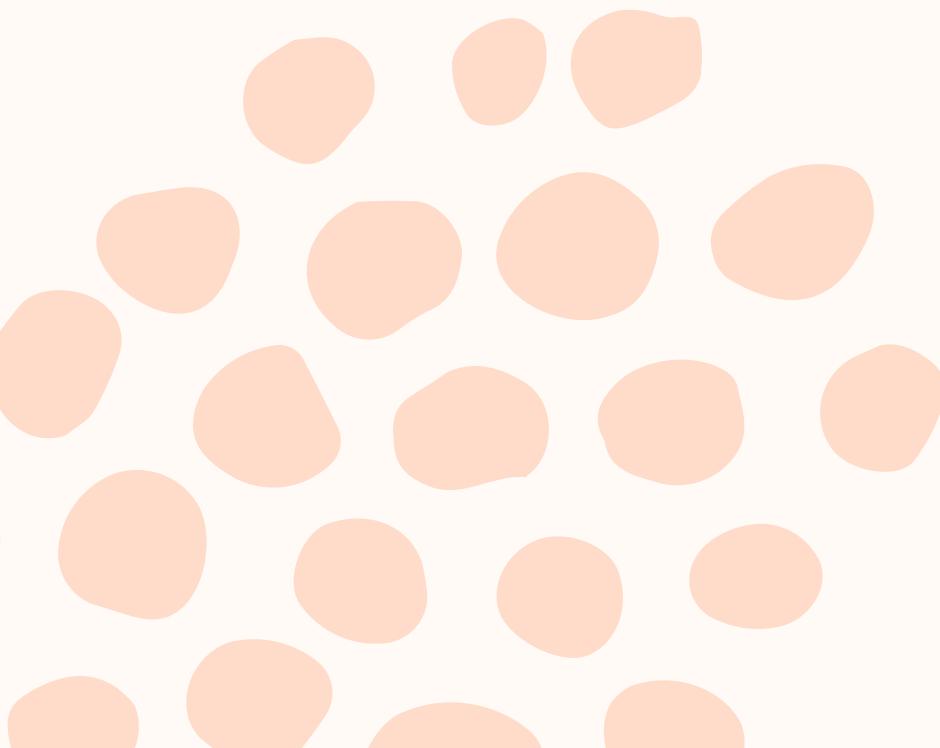
Integrated Camera



- 有暴力簡單的前端頁面
 - video record的方式較複雜
 - 拍攝直接採用for迴圈連拍的方式
 - 連拍後直接下載圖片 進行運算
- * 連拍跟下載的程式碼已完成

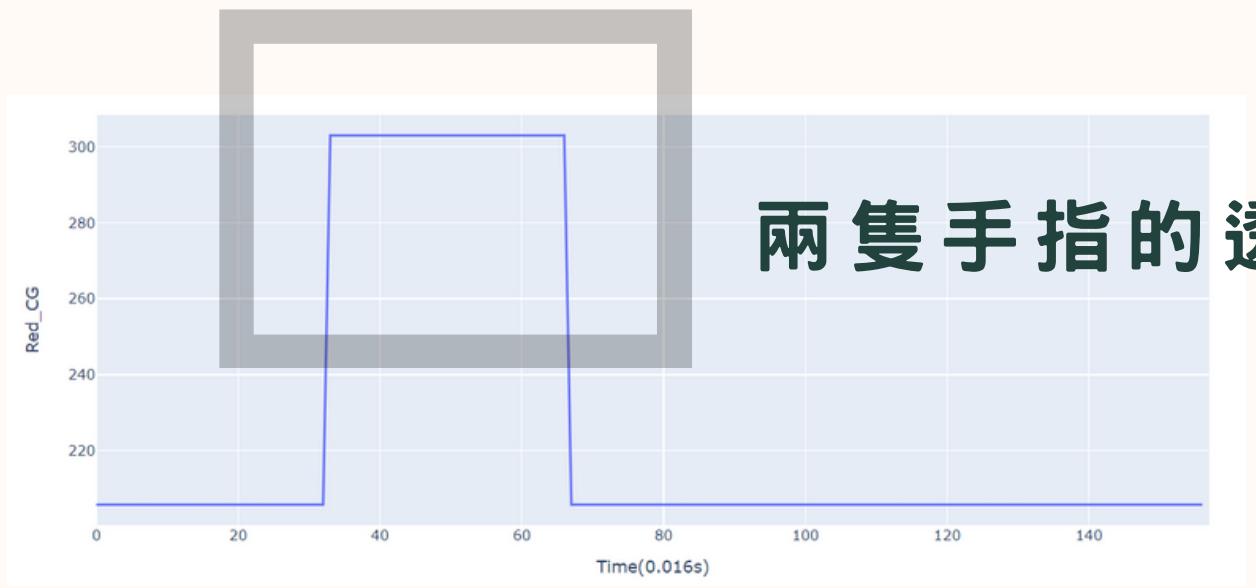
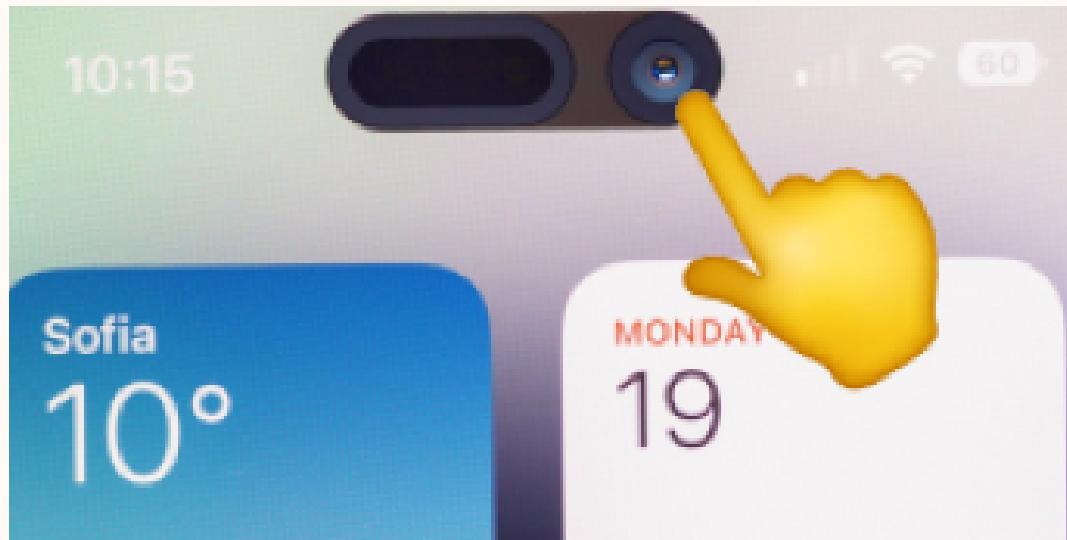
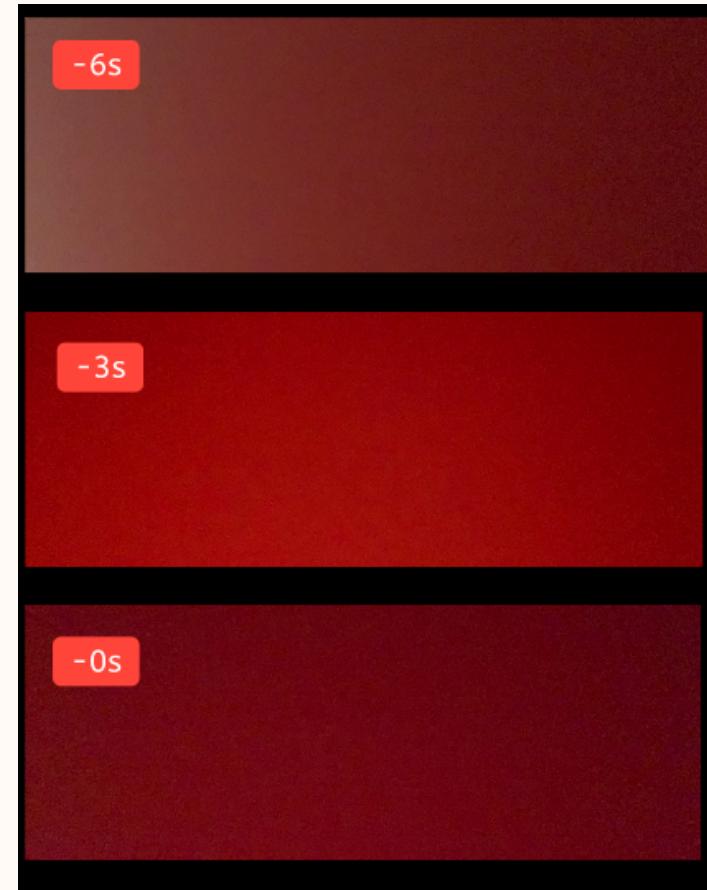


Back End



挖孔相機的問題

- 發現：無太大RGB變化，但暗度變化大
- 推斷-假設不成立：手指用力或輕按，進光量不相同
手指厚度不夠，單指手指的易透光
- 變因影響程度：進光亮 >>> 手指膚色亮暗變化程度
- 故按壓前鏡頭分析 → 可能不可行



兩隻手指的透光較低

RGB 偵測範圍

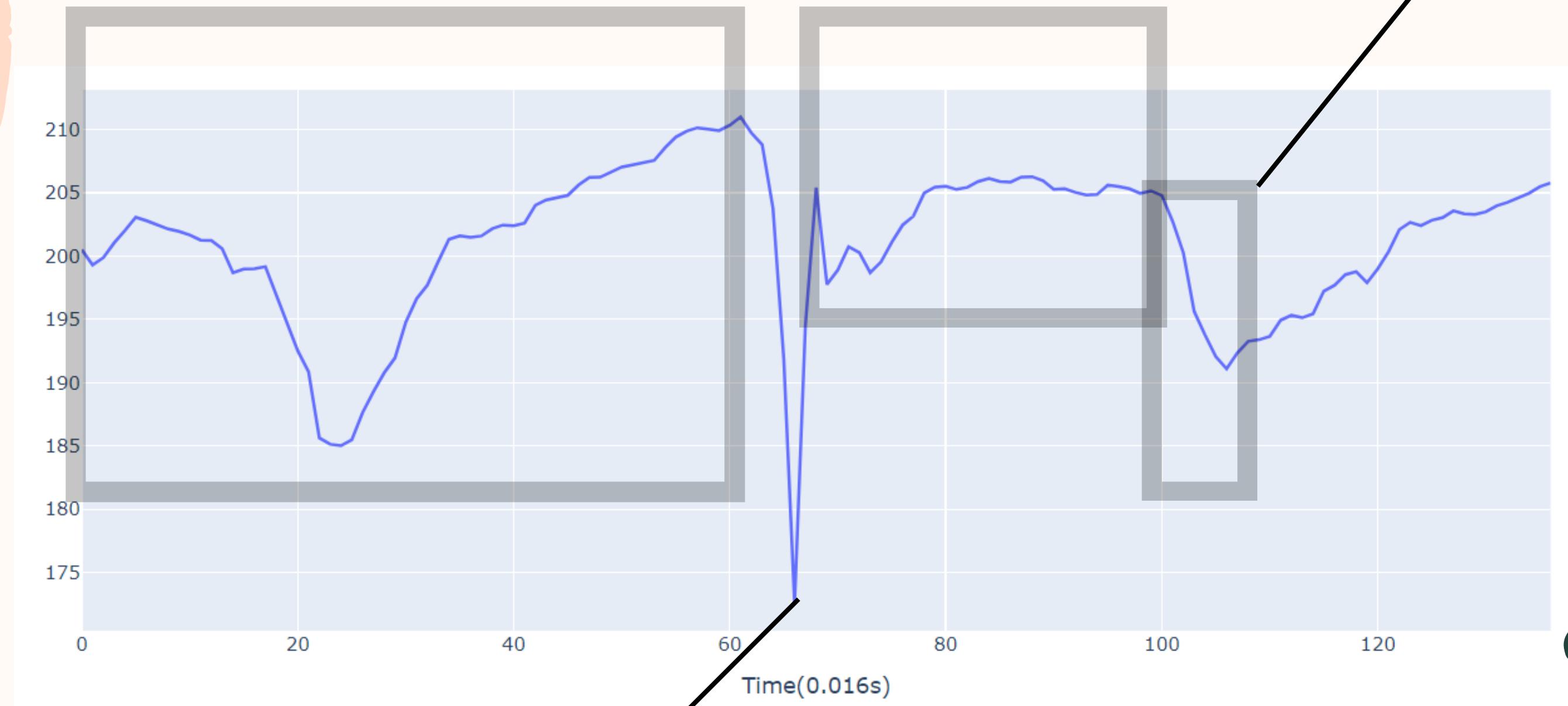


Red

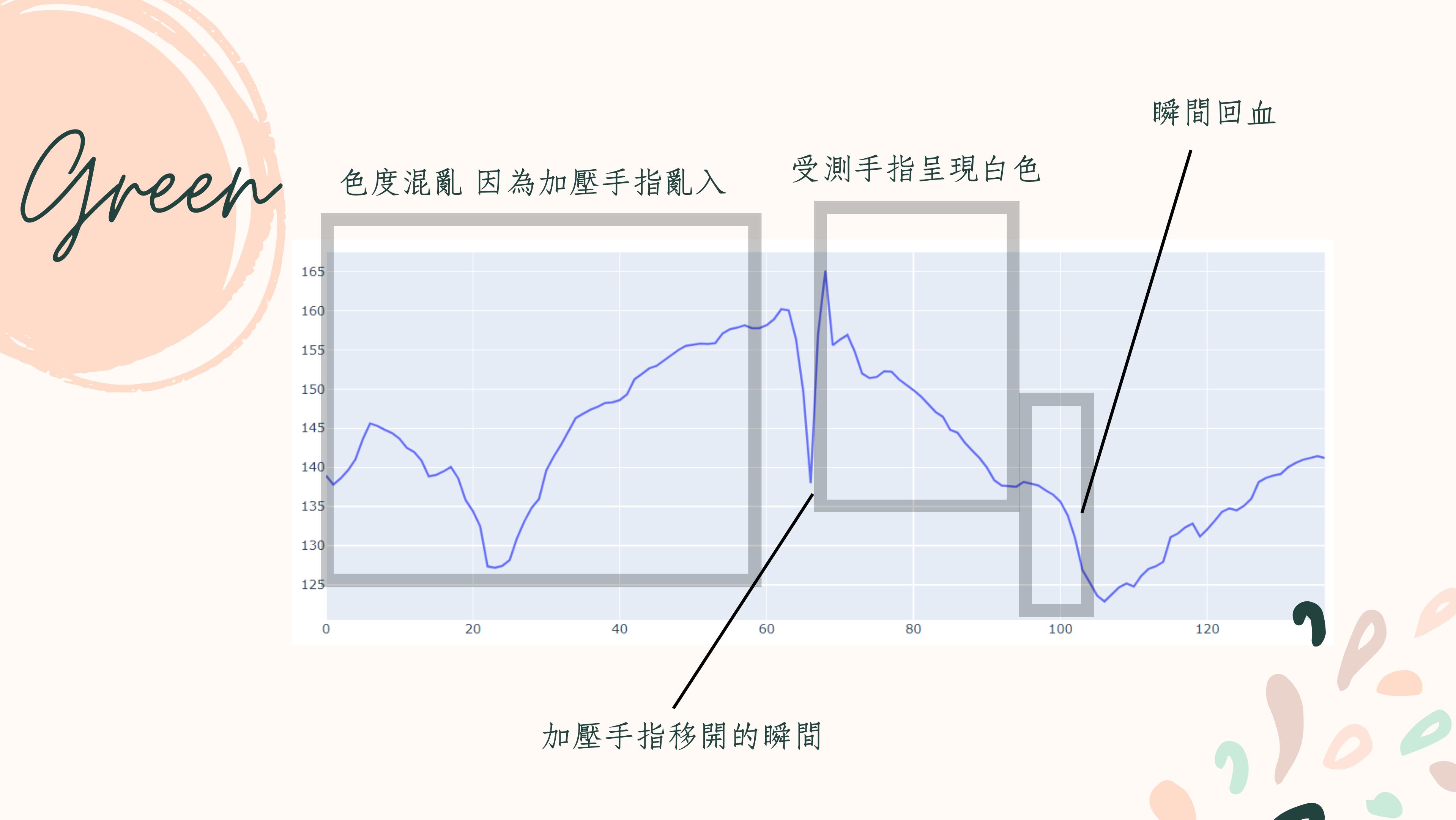
色度混亂 因為加壓手指亂入

受測手指呈現白色

瞬間回血



加壓手指移開的瞬間

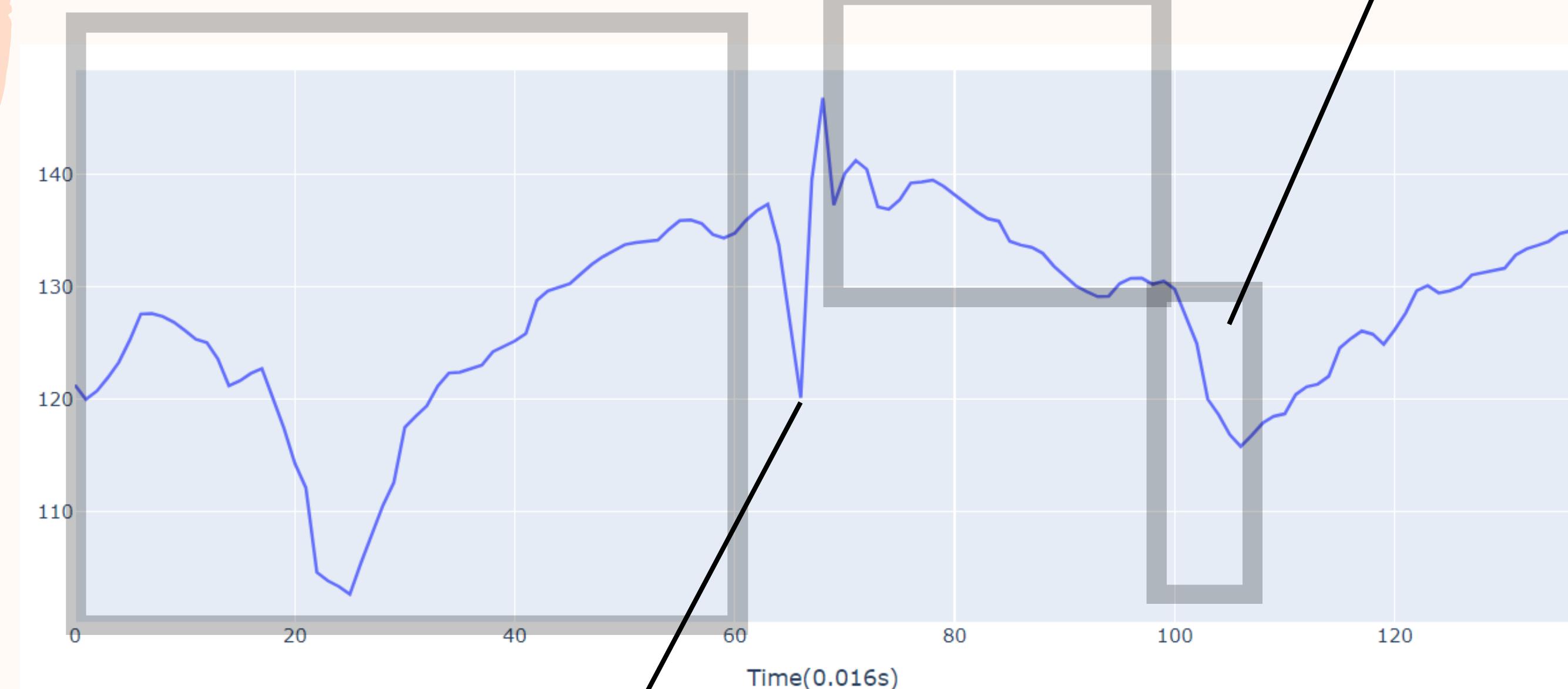


Blue

色度混亂 因為加壓手指亂入

受測手指呈現白色

瞬間回血

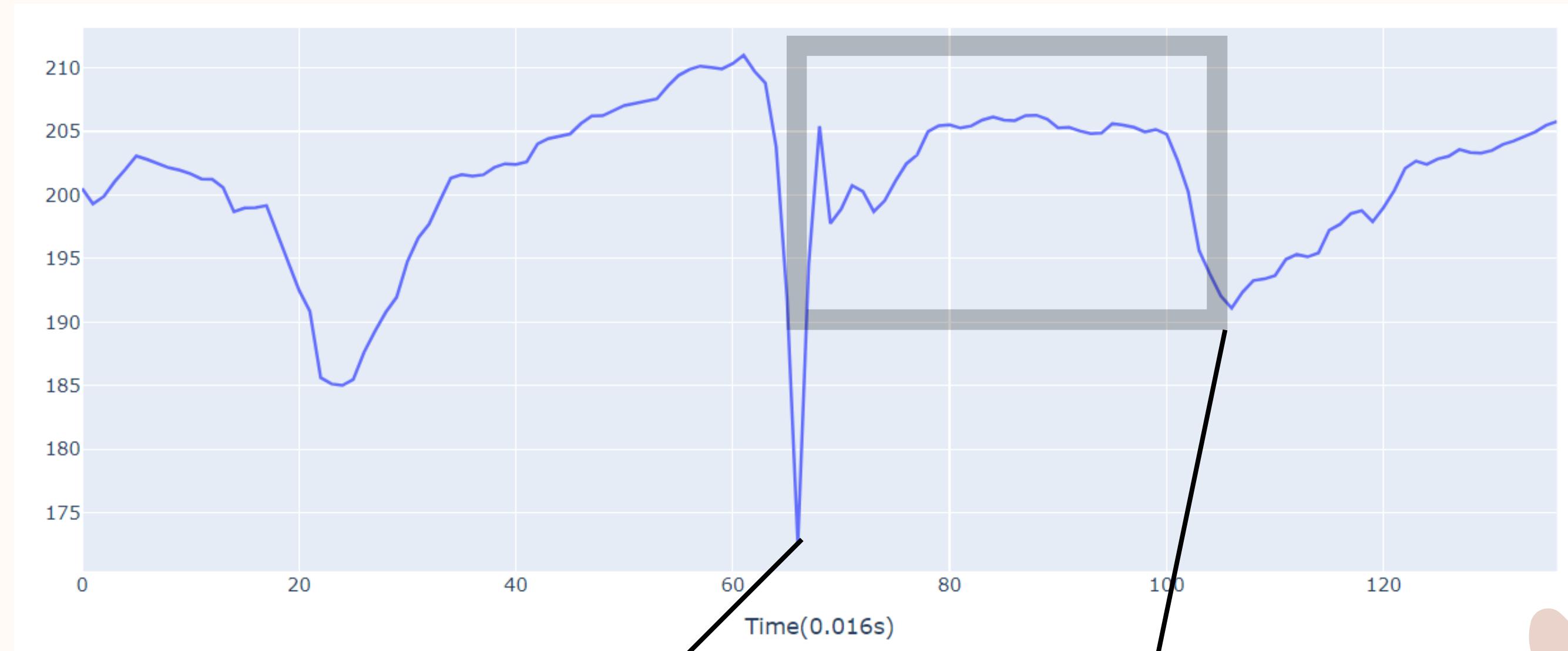


加壓手指移開的瞬間

Calculate

$$(106-66)*0.016 = 0.64$$

受測手指呈現白色



加壓手指移開的瞬間(66)

回血完成(106)



Thank
you