SVV

김상현

SVV 란?

- 정의: 한 호흡 안에서의 SV(심박출량)의 변량.

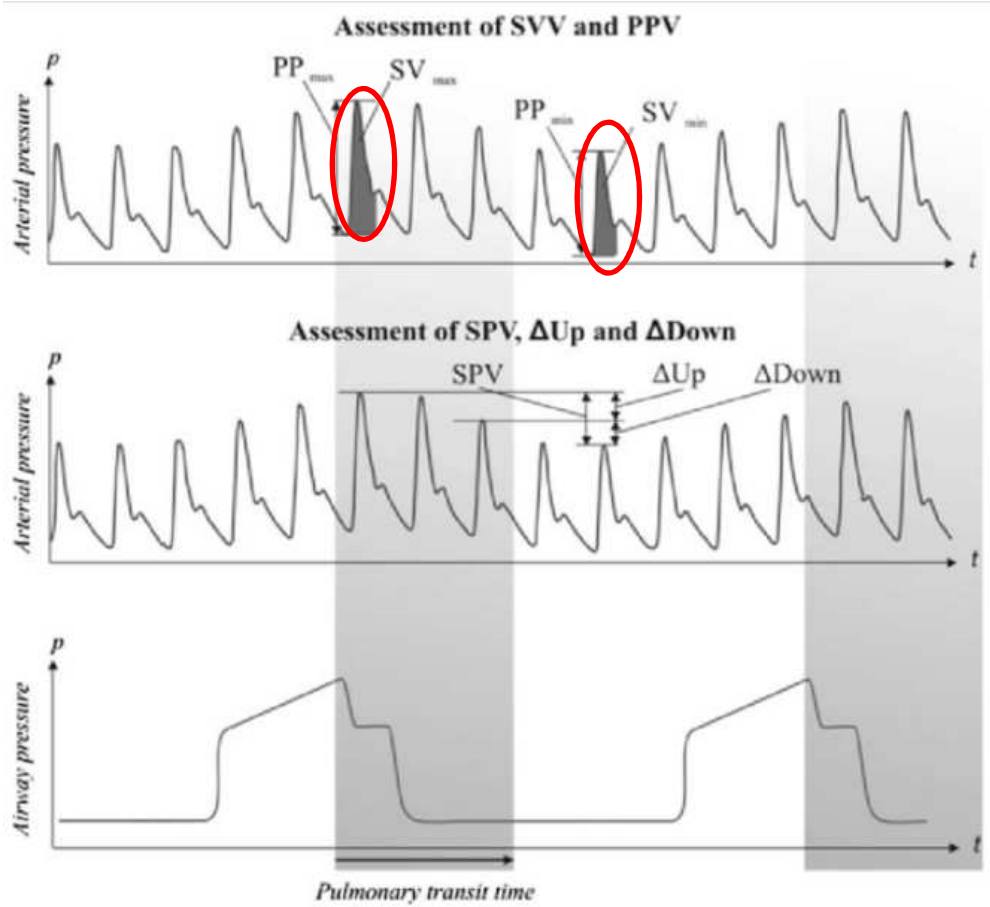
$$SVV = \frac{SV_{max} - SV_{min}}{SV_{mean}}$$

- ABP data를 사용하는 이유:

  EV1000 (Reference model)

  INPUT: ABP data

  OUTPUT: SVV

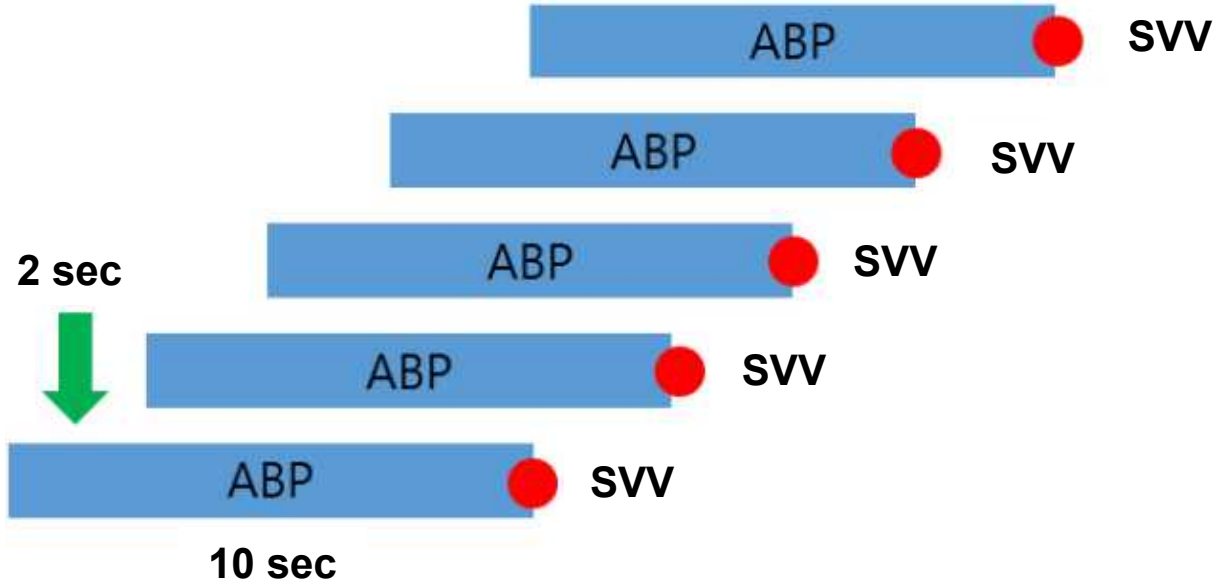


Dataset

- **Window size: 10 sec**
- **Shift time: 2 sec**
- **Delay time: 0 sec**

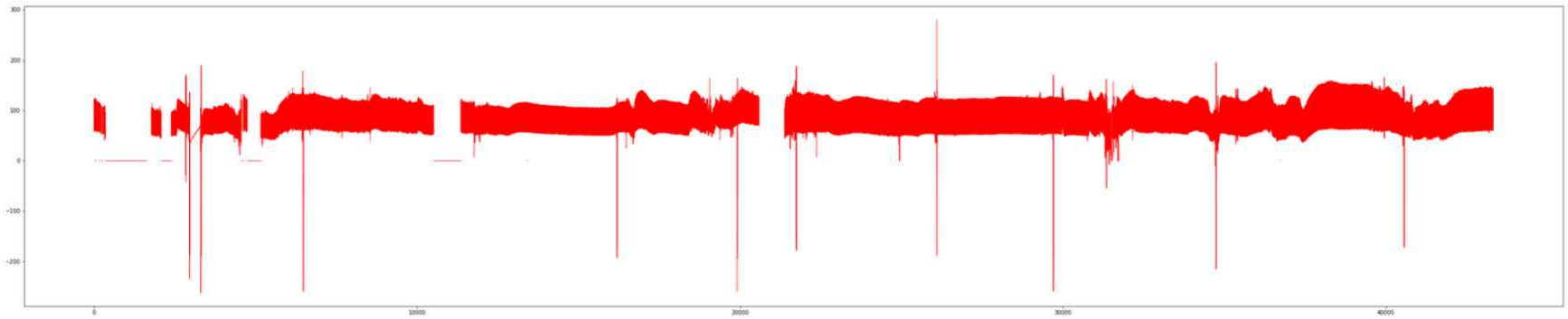
- **Window size가 10 sec 이유?**

  일반적으로 ventilator 의 한 호흡 주기는 10초 보다 짧다.



ABP Data

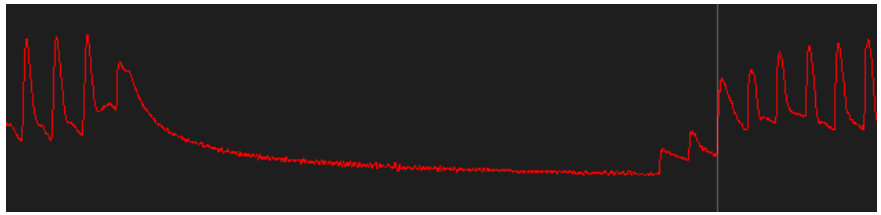
- **Original data**



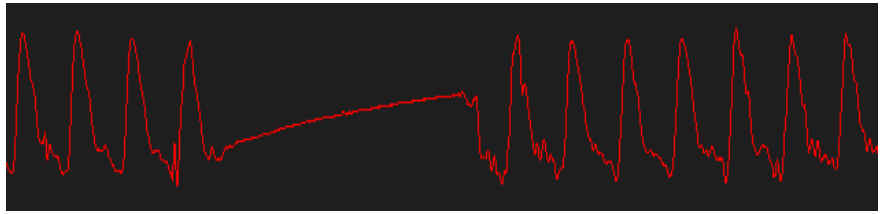
ABP Data

- **Problem**

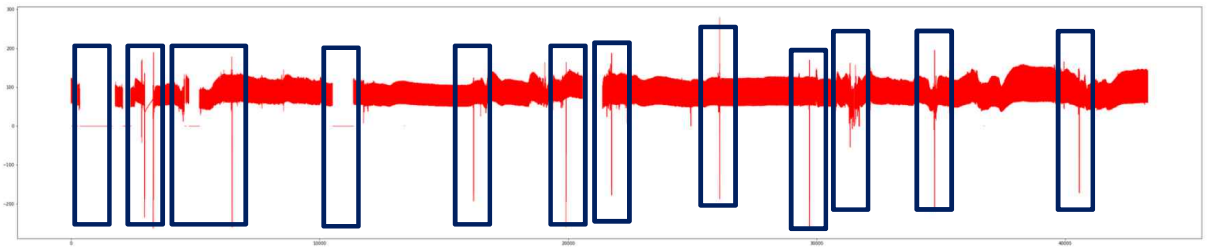
  Noise X, 혈압 재는 상황.



혈액 sample 채취

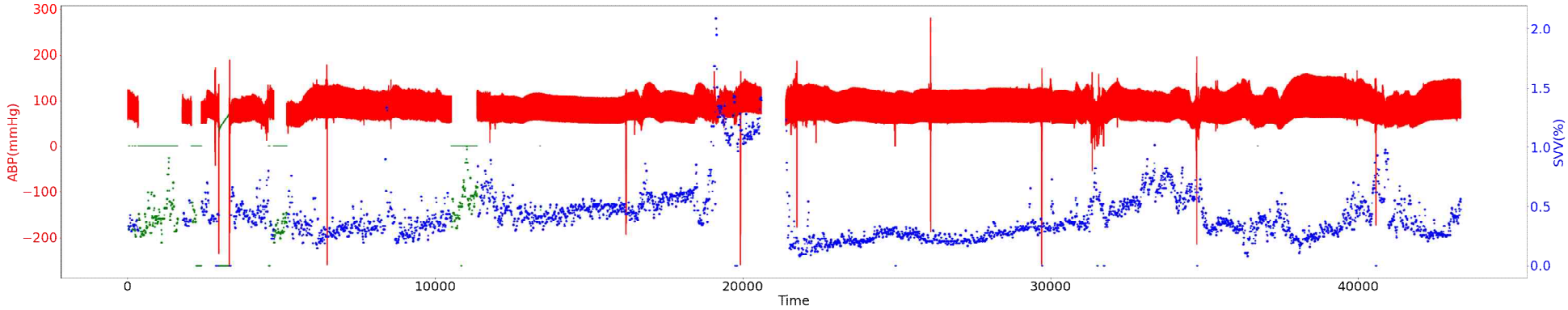


Original

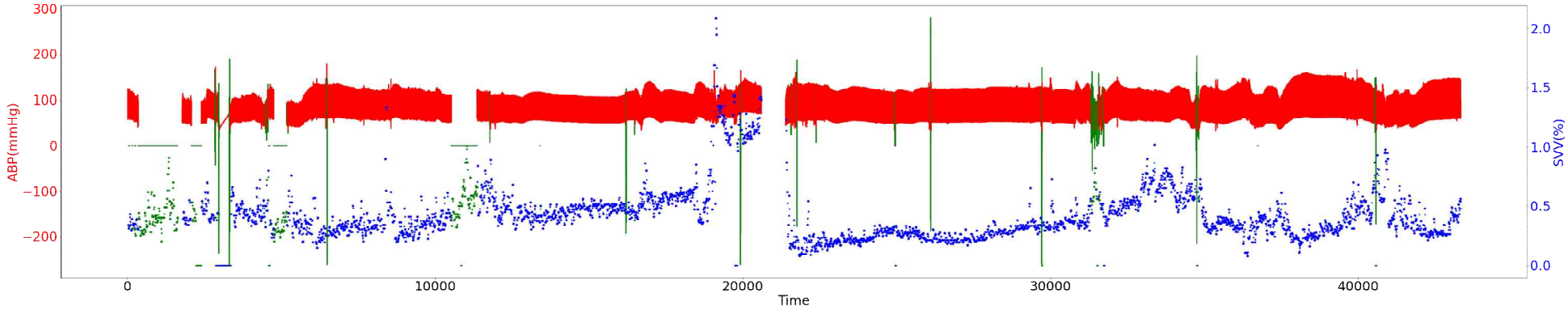


Preprocessing

- 데이터 10초를 5분할 한 뒤, (최고점 - 최저점)의 SUM이 10보다 작으면 제거.

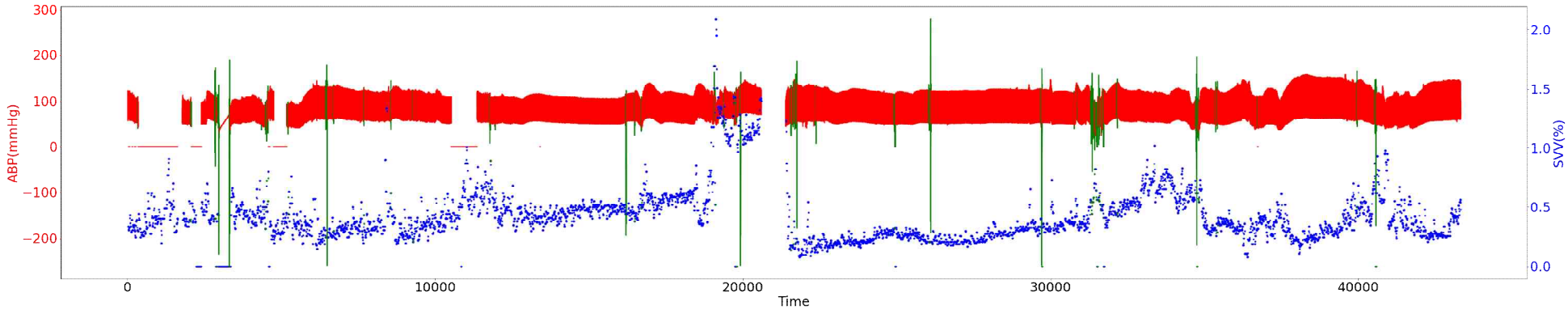


- ABP 데이터 값이 범위 30에서 250사이 외에 있으면 제거.



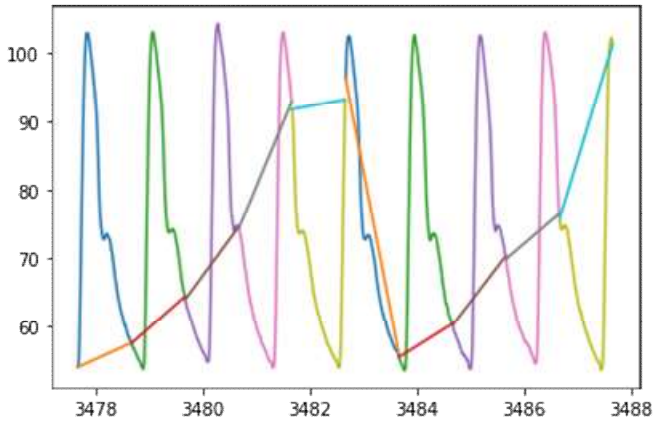
Preprocessing

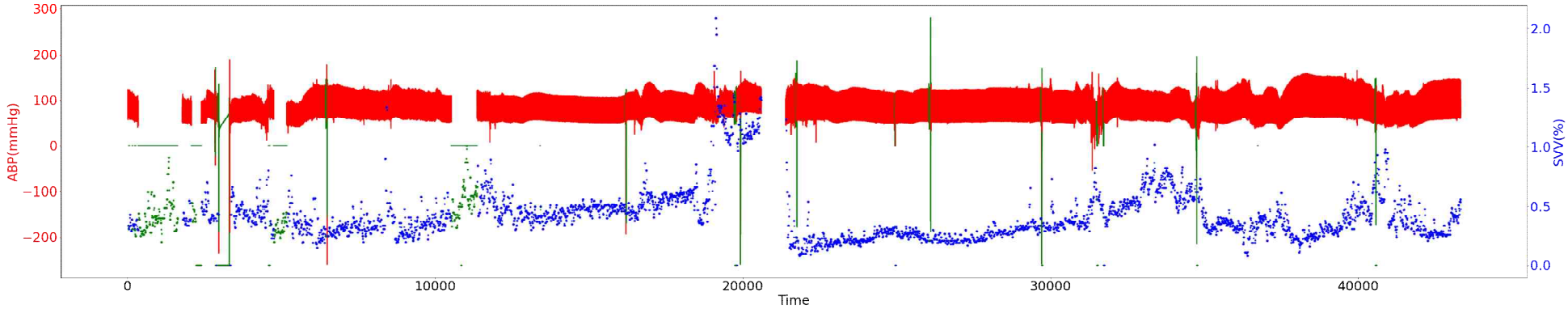
- **현재 ABP 비트와 하나 이전의 ABP 비트의 차이가 15mmHg이상 차이가 나면 제거.**



Preprocessing

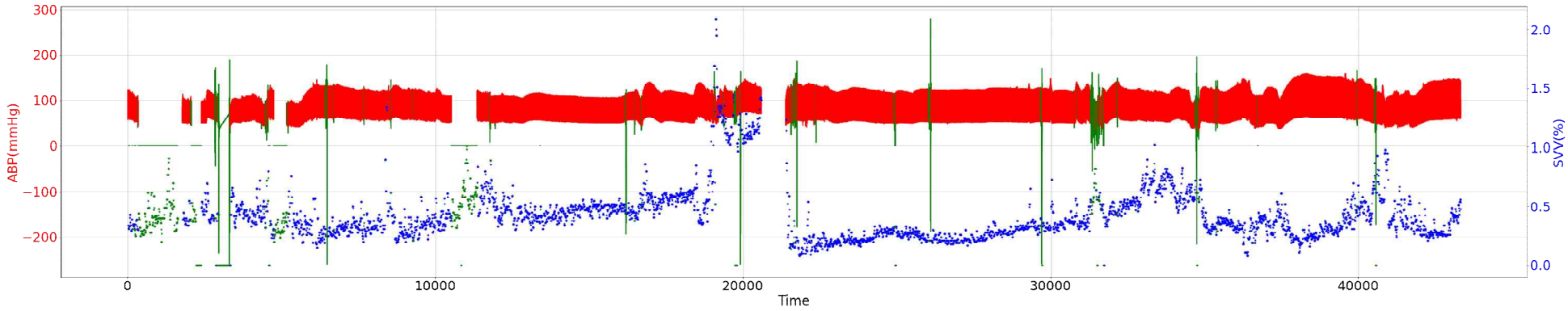
- 곡률에 따른 예외처리.

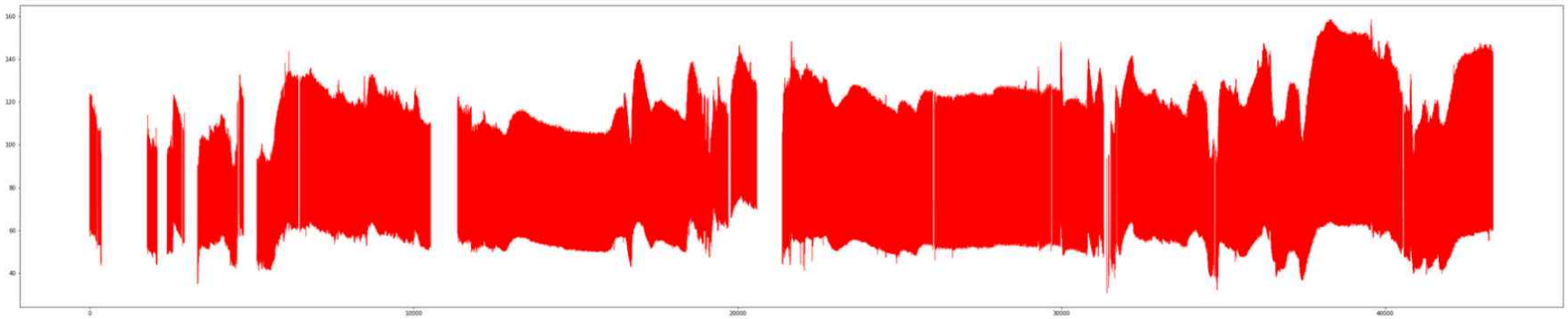




Preprocessing

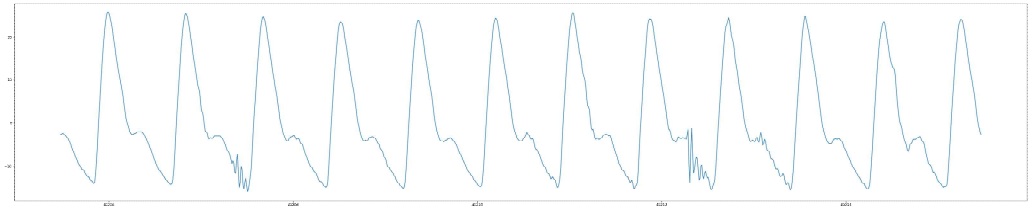
- **Final preprocessing**



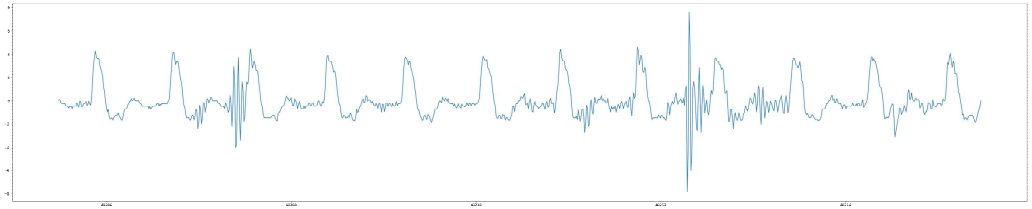


Preprocessing (Feature 추가)

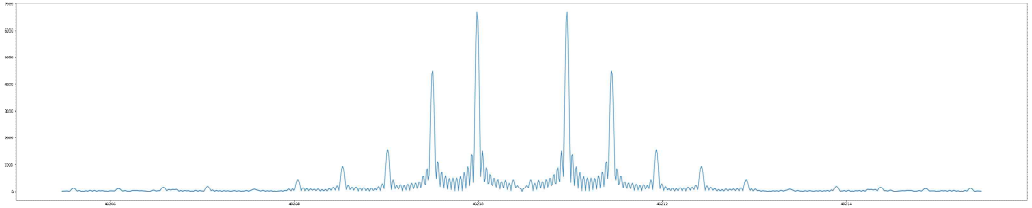
- **ABP (Original Data)**



- **Slope**

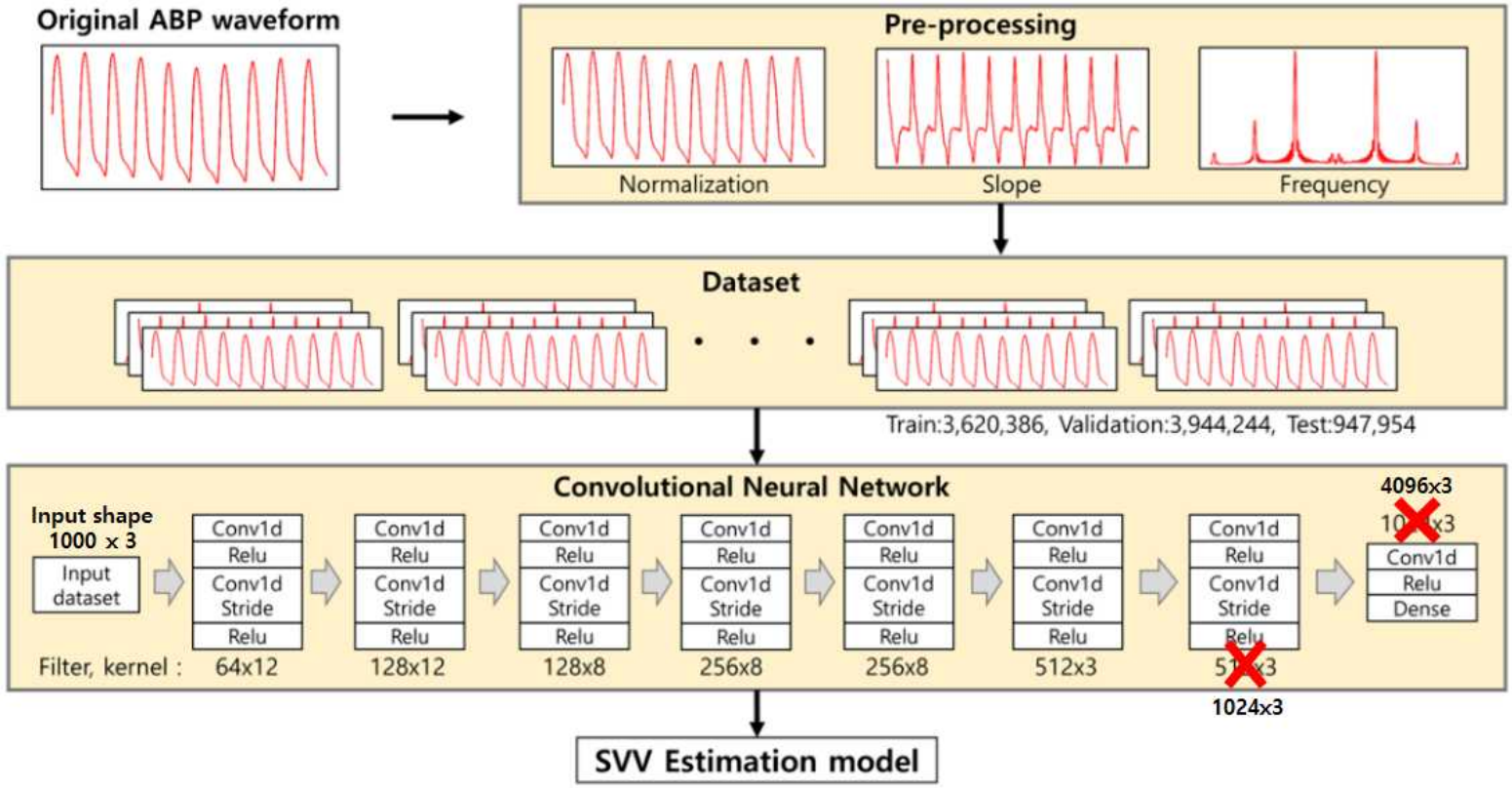


- **FFT**



Experiment 1

- **Version 1.0 (base model)**



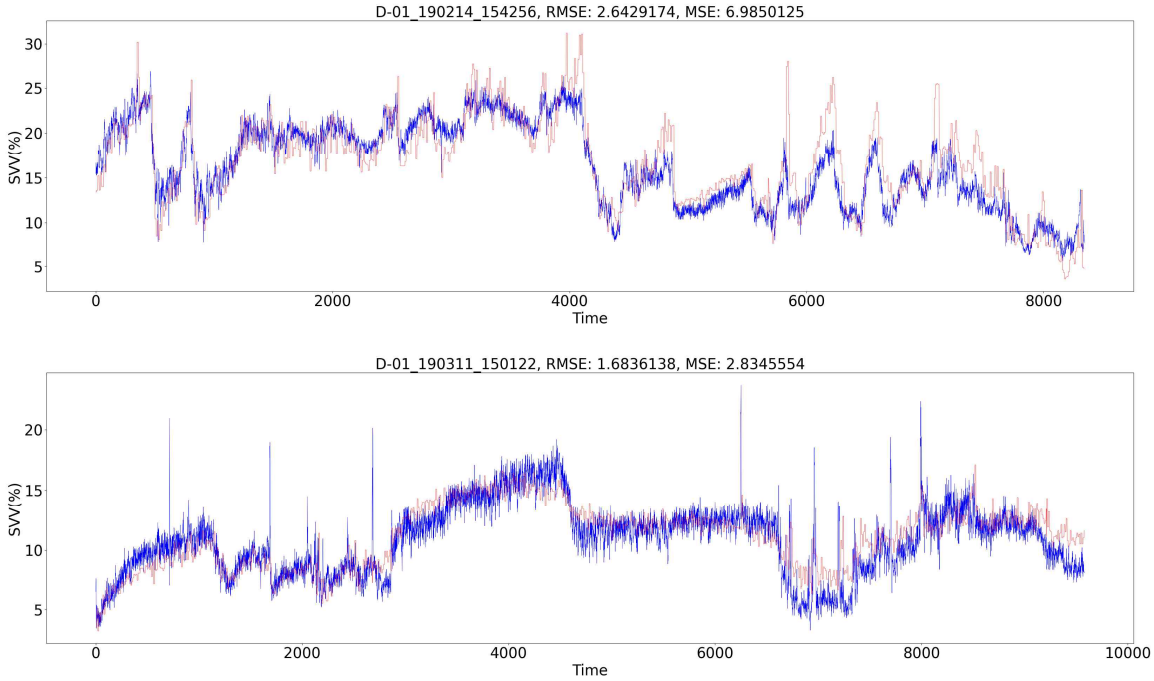
Experiment 1

- **Version 1.0 (base model)**

  MSE 평균: 10.44

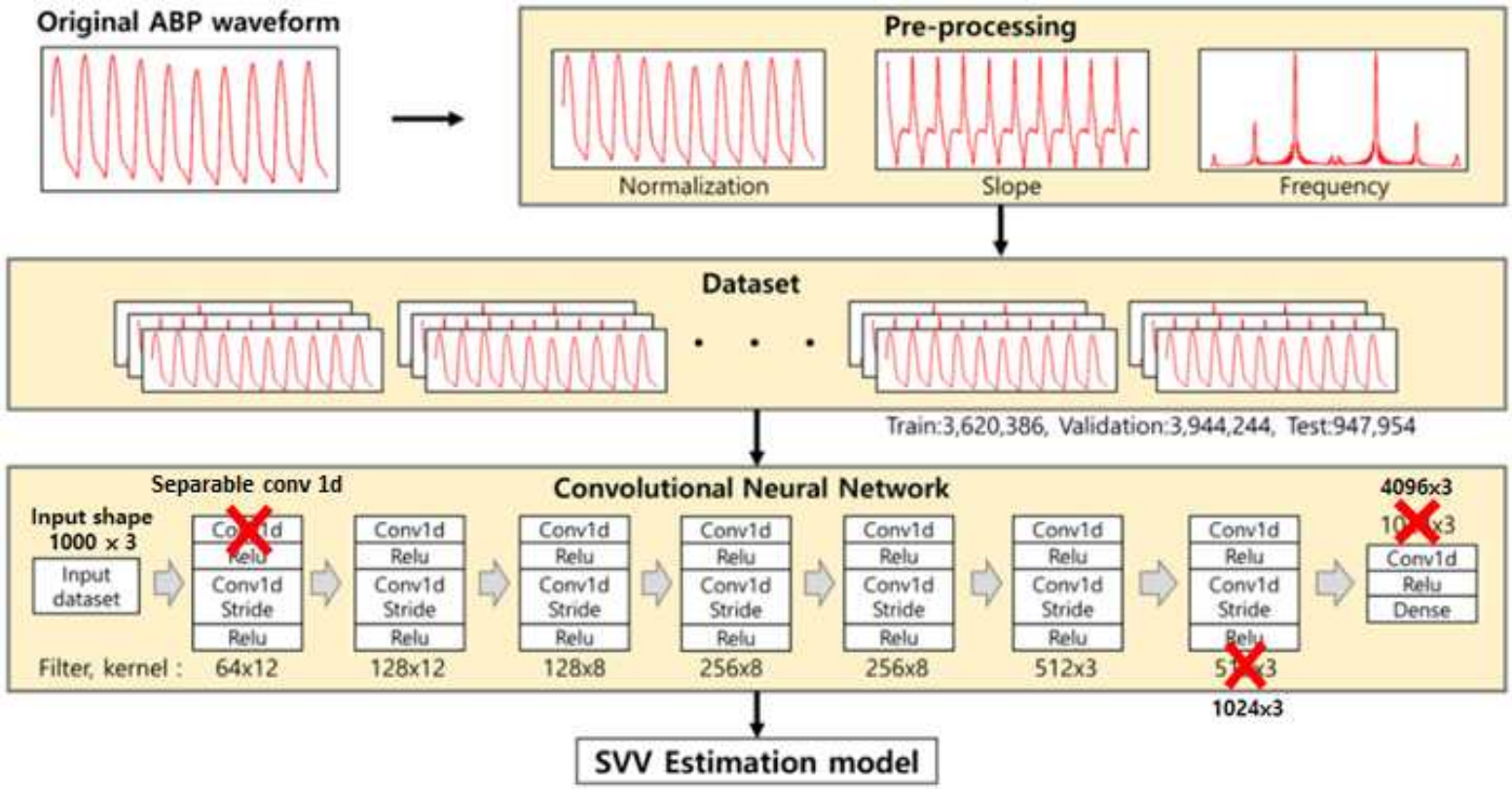
  MSE 분산: 73.65

  MSE 표준편차: 8.58



Experiment 2

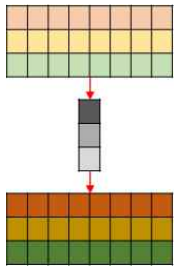
- **Version 1.1 (base model)**



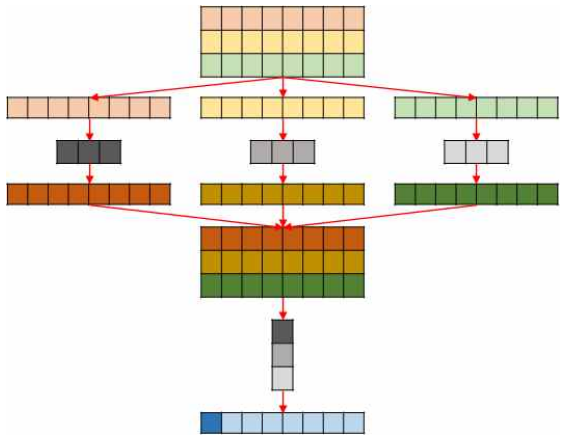
Experiment 2

- **Version 1.1 (base model)**

  Convolution



  Separable convolution



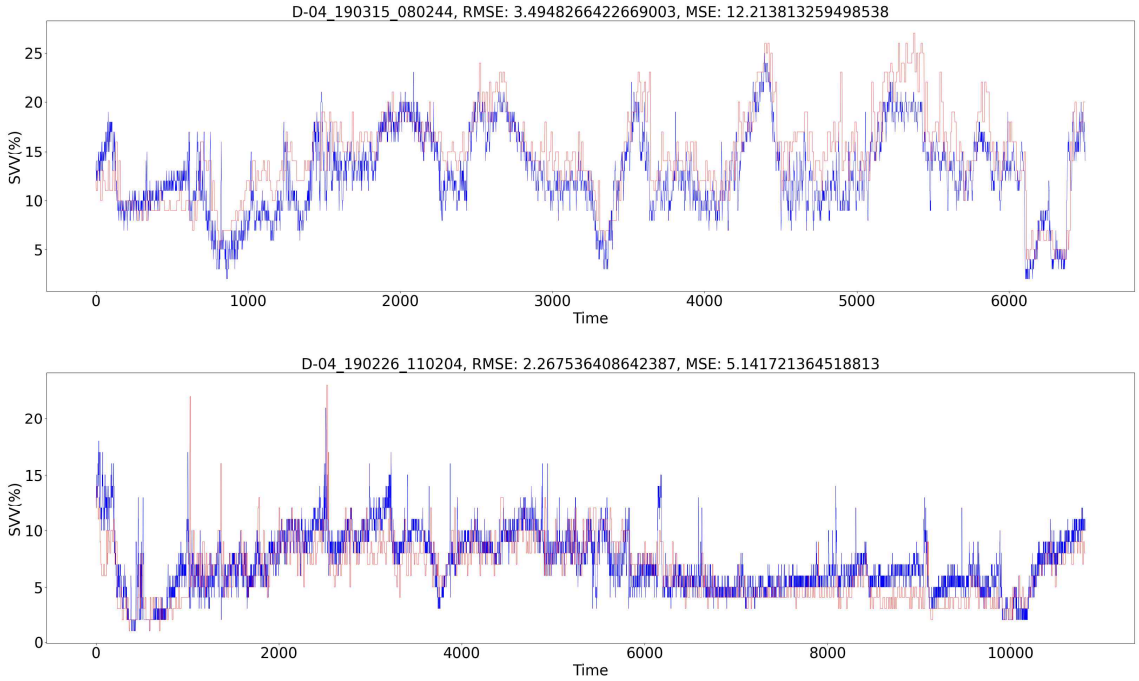
Experiment 2

- **Version 1.1 (base model)**

  MSE 평균: 9.80

  MSE 분산: 81.98

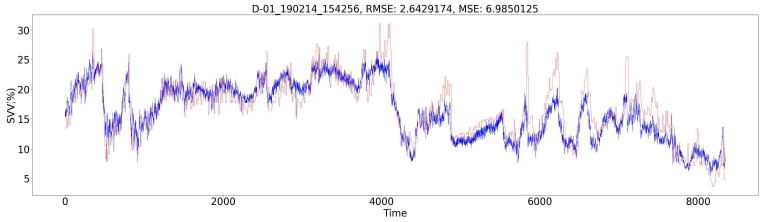
  MSE 표준편차: 9.05

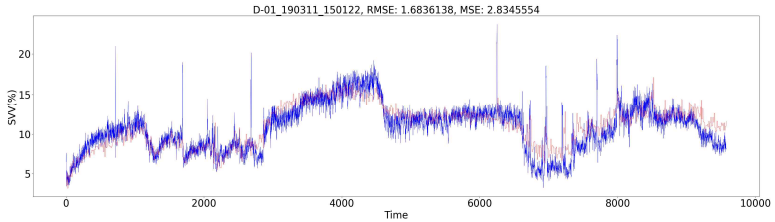


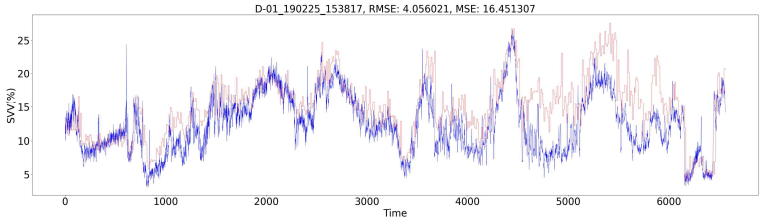
Experiment 2

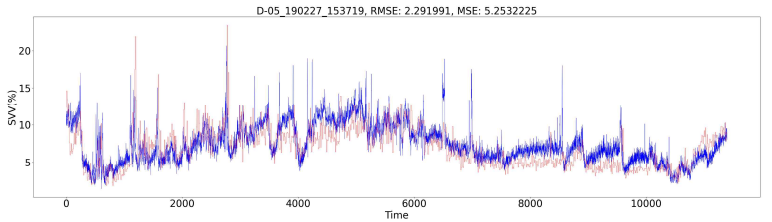
	Version 1.0	Version 1.1
MSE 평균	10.44	9.8
MSE 분산	73.65	81.98
MSE 표준편차	8.58	9.05
+SD1.96	7.87	6.31
-SD1.96	-6.92	-5.55
Mean diff	0.48	0.38
Pearson Correlation	0.7	0.82
ICC	0.68	0.81

Result

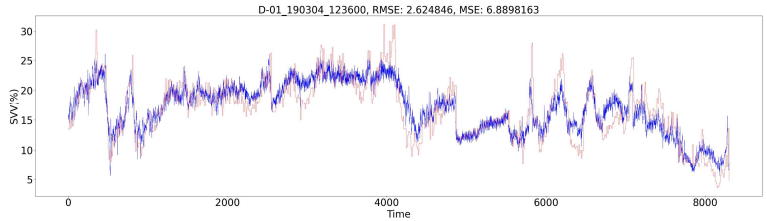


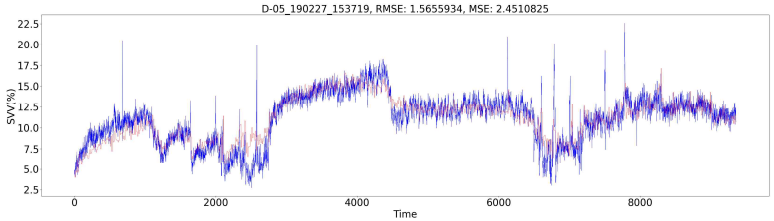


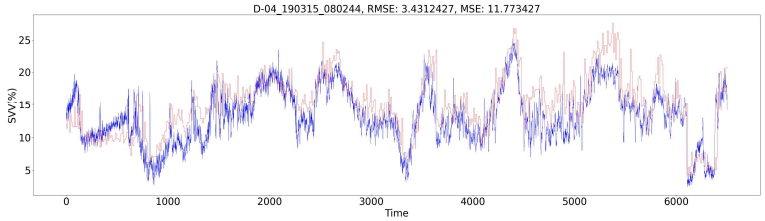


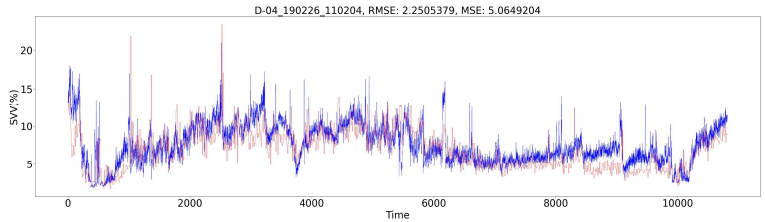


Version 1.0



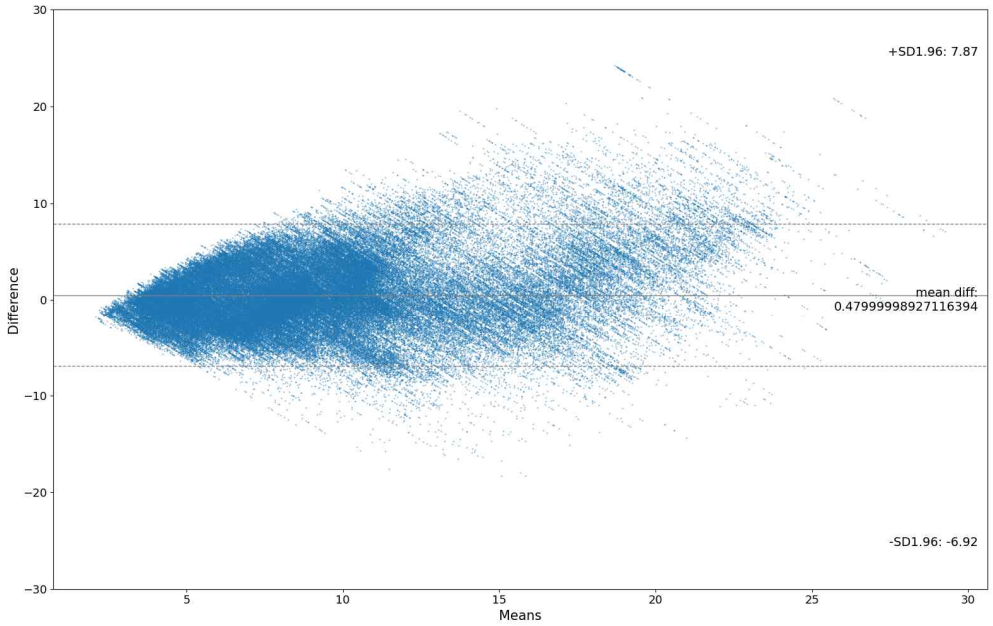




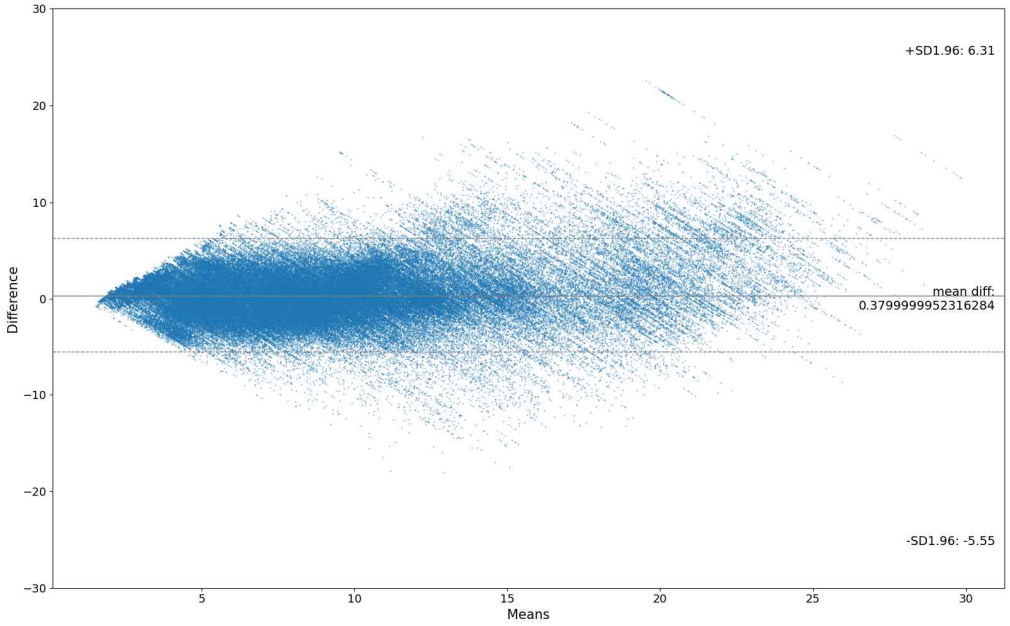


Version 1.1

Result

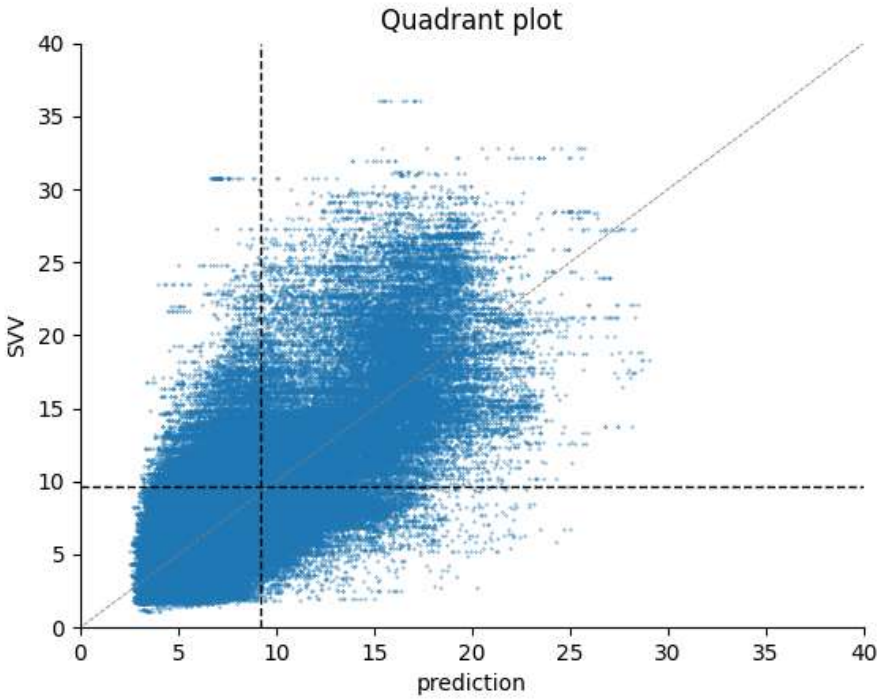


Version 1.0

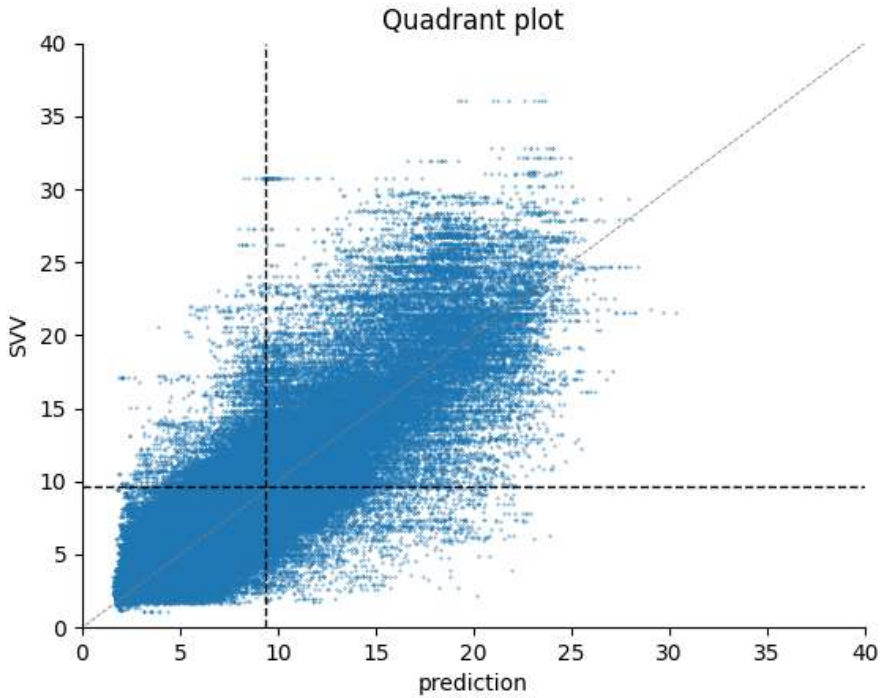


Version 1.1

Result



Version 1.0



Version 1.1

Result

```
 Single Score Intraclass Correlation

   Model: twoway
   Type : agreement

   Subjects = 151424
     Raters = 2
   ICC(A,1) = 0.68

 F-Test, H0: r0 = 0 ; H1: r0 > 0
F(151423,5872) = 5.32 , p = 0

 95%-Confidence Interval for ICC Population Values:
  0.67 < ICC < 0.69
```

Version 1.0

```
 Single Score Intraclass Correlation

   Model: twoway
   Type : agreement

   Subjects = 151424
     Raters = 2
   ICC(A,1) = 0.809

 F-Test, H0: r0 = 0 ; H1: r0 > 0
F(151423,5273) = 9.62 , p = 0

 95%-Confidence Interval for ICC Population Values:
  0.803 < ICC < 0.816
```

Version 1.1