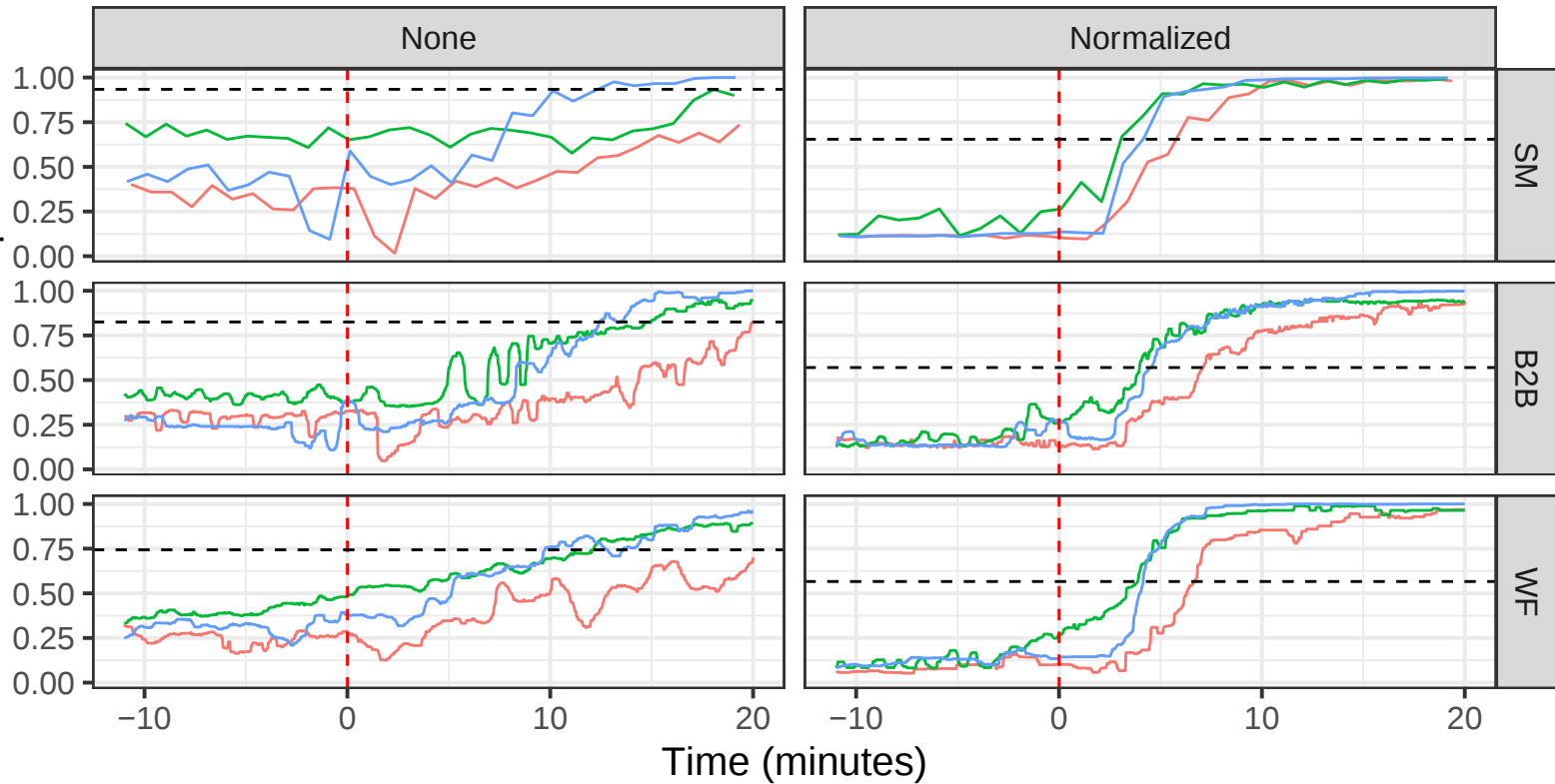
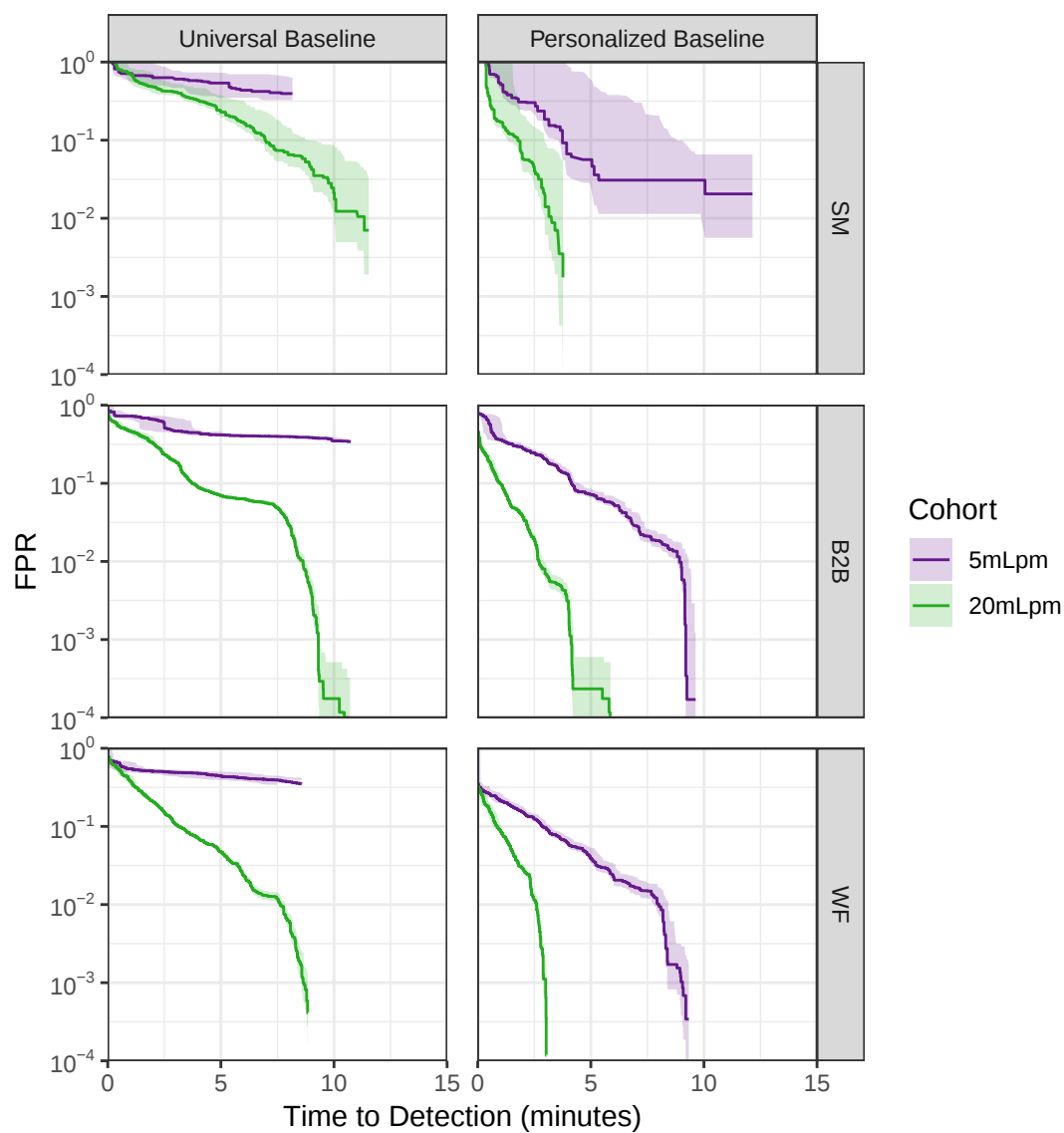


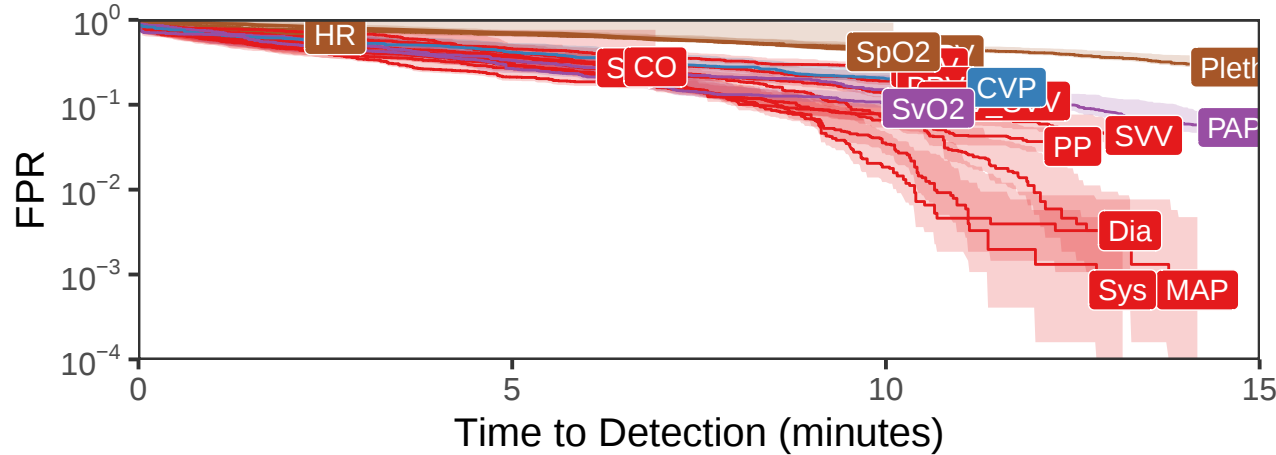
Raw Predictor Output





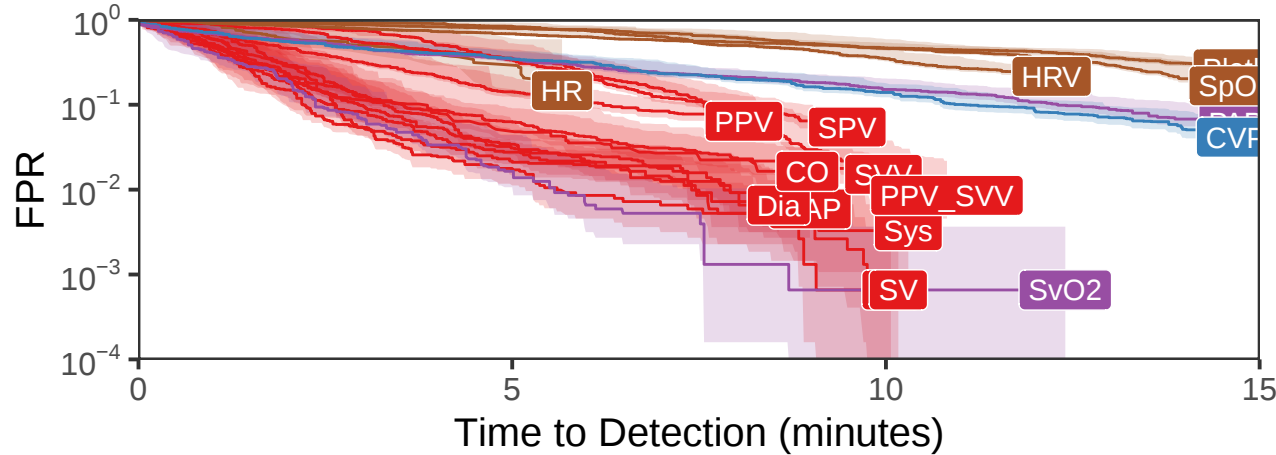
A

Universal Normalization



B

Personalized Normalization

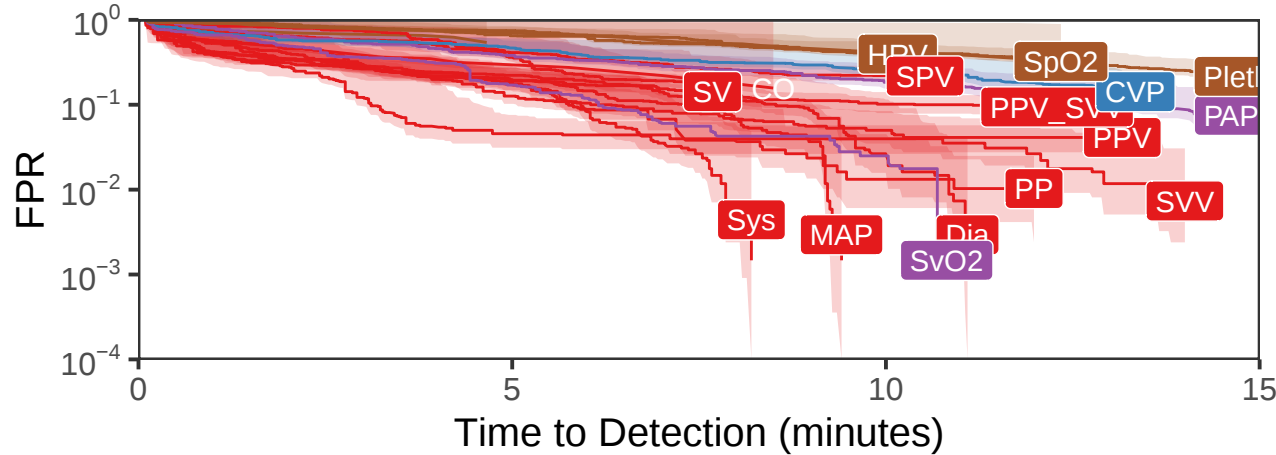


Group

- a NIM
- a CVC
- a PAC
- a ART

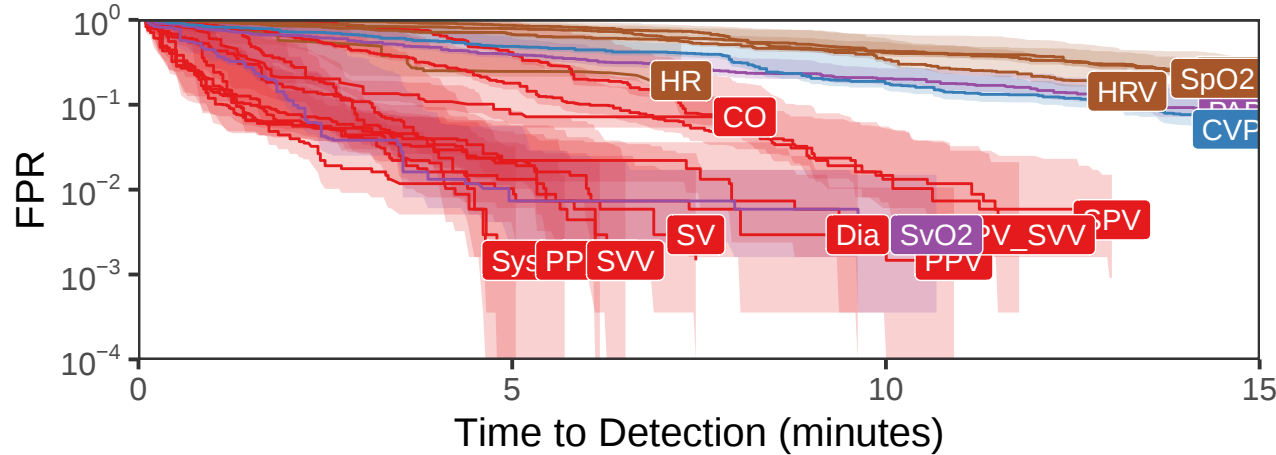
A

Universal Normalization



B

Personalized Normalization



Group

- a NIM
- a CVC
- a PAC
- a ART

Table E1. Best Predictors of No Bleed State (Negative predictors) by Level of Featurization and Normalization for 5 ml·min⁻¹ Bleeding Rate

Simple Metrics			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	0.786	CVP_sma_20_norm	1.543
SvO2_sma_20	0.710	MAP_norm	1.395
MAP	0.660	PAP_sma_20_norm	1.382
CVP_sma_20	0.384	SvO2_sma_20_norm	1.367
Sys	0.207	MeanCO_norm	1.299

Beat-to-Beat			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	2.789	SvO2_sma_20_norm	4.906
Sys	1.474	CVP_sma_20_norm	4.680
MAP	1.393	PAP_sma_20_norm	4.539
SvO2_sma_20	1.362	MeanCO_norm	4.097
CVP_sma_20	1.267	Sys_norm	3.949

Waveform			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	2.532	AP_median_4min_norm	5.588
Sys_median_4min	1.866	MAP_median_4min_norm	5.344
CVP_median_4min	1.458	PAP_median_4min_norm	5.203
CVP_dft_4min_90_VVHF_power	1.350	PAP_mean_4min_norm	5.017
AP_median_4min	1.333	Sys_median_4min_norm	4.989

Table Legend. Most informative features in prediction of stable state (negatives) for the 5 ml·min⁻¹ cohort ranked by maximum observed information gain IGMax).

Table E2. Best Predictors of Bleed State (Positive predictors) by Level of Featurization and Normalization for 5 ml·min⁻¹ Bleeding Rate

Simple Metrics			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	2.406	PAP_sma_20_norm	6.013
PP	2.242	CVP_sma_20_norm	5.888
SvO2_sma_20	2.166	MAP_norm	5.072
Sys	1.996	PP_norm	5.050
CVP_sma_20	1.691	Sys_norm	4.921
Beat-to-Beat			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	11.697	PAP_sma_20_norm	20.044
PAP_SPV	11.475	CVP_sma_20_norm	19.215
PP	10.986	PP_norm	17.516
MAP	10.966	SvO2_sma_20_norm	17.105
Sys	10.629	Sys_norm	16.976
Waveform			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_SPV	9.982	PAP_sma_20_norm	19.496
AP_sma_20	9.308	PAP_mean_4min_norm	19.303
Sys	9.058	CVP_median_4min_norm	18.488
MAP	8.824	CVP_sma_20_norm	18.326
APCVP_diffmean_mean_Expiration	4.717	CVP_mean_4min_norm	17.910

Most informative features in prediction of bleeding state (positives) for the 5 mL·min⁻¹ cohort ranked by maximum observed information gain (IGMax).

Table E3. Best Predictors No Bleed State (Negative predictors) by Level of Featurization and Normalization for 20 ml·min⁻¹ Bleeding Rate

Simple Metrics			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	2.406	PAP_sma_20_norm	6.013
PP	2.242	CVP_sma_20_norm	5.888
SvO2_sma_20	2.166	MAP_norm	5.072
Sys	1.996	PP_norm	5.050
CVP_sma_20	1.691	Sys_norm	4.921
Beat-to-Beat			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	11.697	PAP_sma_20_norm	20.044
PAP_SPV	11.475	CVP_sma_20_norm	19.215
PP	10.986	PP_norm	17.516
MAP	10.966	SvO2_sma_20_norm	17.105
Sys	10.629	Sys_norm	16.976
Waveform			
Detecting Stable			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_SPV	9.982	PAP_sma_20_norm	19.496
AP_sma_20	9.308	PAP_mean_4min_norm	19.303
Sys	9.058	CVP_median_4min_norm	18.488
MAP	8.824	CVP_sma_20_norm	18.326
APCVP_diffmean_mean_Expiration	4.717	CVP_mean_4min_norm	17.910

Most informative features in prediction of stable state (negatives) for the 20 mL·min⁻¹ cohort ranked by maximum observed information gain (IGMax).

Table E4. Best Predictors Bleed State (Positive predictors) by Level of Featurization and Normalization for 20 ml·min⁻¹ Bleeding Rate

Simple Metrics			
Detecting Bleed			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_sma_20	2.738	PAP_sma_20_norm	6.795
Sys	2.691	CVP_sma_20_norm	6.203
MAP	1.754	PP_norm	5.211
Dia	1.162	SvO2_sma_20_norm	4.760
SvO2_sma_20	0.847	MAP_norm	4.398
Beat-to-Beat			
Detecting Bleed			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
Sys	13.119	PAP_sma_20_norm	20.209
PAP_SPV	11.772	CVP_sma_20_norm	19.031
PAP_sma_20	11.705	Sys_norm	17.823
MAP	10.903	Dia_norm	16.912
SVV	10.487	SvO2_sma_20_norm	15.971
Waveform			
Detecting Bleed			
Universal Baseline		Personalized Baseline	
Attribute	IGMax	Attribute	IGMax
PAP_SPV	10.714	CVP_median_4min_norm	19.290
SvO2_sd_4min	10.114	PAP_sma_20_norm	19.231
SvO2_range90_4min	9.499	PAP_mean_4min_norm	18.891
AP_sma_20	9.146	CVP_mean_4min_norm	18.558
MAP_sd_4min	9.104	CVP_sma_20_norm	17.624

Most informative features in prediction of bleeding state (positives) for the 20 mL·min⁻¹ cohort ranked by maximum observed information gain (IGMax).