1 PUBLIC MULTI-TYPE PHYSIOLOGICAL SIGNAL DATASETS

In the field of physiological signals, as an emerging research area, there is an increasing number of datasets oriented towards various experiments or tasks being released. Nonetheless, due to the multitude of signal types, high collection costs, and involvement of ethical reviews, these physiological datasets are characterized by small scale, numerous in quantity, and lack of summarization. As an organization that compiles physiological signal datasets, PhysioNet [5] is an inspiring example. It lists a significant number of public datasets in many scenarios including sleep, emotion, heart rhythm, and more. However, PhysioNet does not distinguish between single and multiple types of physiological signals, nor does it include some recently released datasets.

To address these issues and serve as a research resource for multi-type signal modeling, we summarize those public datasets that contain two or more types of signals among EEG, EOG, ECG, and EMG, as presented in Tab. 1. We provide statistical information including data size, number of participating subjects (#Subj.), number of channels (#Ch.) and sampling rate (Samp.) for each signal, in the table for researchers to reference based on their needs.

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Table 1: A review of the public multi-type physiological datasets. In the table, ">0" indicates that the dataset includes the type of signals, but we cannot provide the channel number due to access restrictions. "-" indicates that the dataset does not contain the signal. "various" indicates inconsistent sampling rates within the dataset. "D*" is the abbreviation of the DREAMS dataset.

Exp/Task	Year	Dataset	Size	#Subj.	EEG		ECG		EOG		EMG		Other Recordings	Access
					#Ch.	Samp.	#Ch.	Samp.	#Ch.	Samp.	#Ch.	Samp.		
Sleep Staging	2003	SHHS [14]	0.01GB	120	2	125Hz	1	125/ 250Hz	2	50Hz	1	125Hz	Thoracic, abdominal excursions, airflow, pulse oximetry, heart rate, body position, ambient light	Link
	2013	Sleep-EDFx [9]	8.1GB	78	2	100 Hz		-	1	100 Hz	1	100 Hz	Airflow, rectal body temperature	Link
	2014	MASS [13]	no_info	200	4-20	256Hz	>0	256Hz	>0	256Hz	>0	256Hz	Respiratory effort	Need an ethical approval proof
	2015	ISRUC [10]	27GB	118	6	200Hz	1	200Hz	2	200Hz	3	200Hz	Snoring, airflow, abdominal efforts, pulse oximetry, body position	Link
	2021	NCH [12]	no_info	3673	>0	various	>0	various	>0	various	>0	various	Airflow, respiratory effort, blood oxygen saturation, end-tidal CO_2	Need request & credentialing
	2022	HMC [1]	15.7GB	151	4	256Hz	1	256Hz	2	256Hz	1	256Hz	-	Link
Cyclic Alternating Pattern	2012	CAP [16]	40.1GB	108	3	512Hz	1	512Hz	2	512Hz	2	512Hz	Airflow, abdominal and thoracic effort and SaO_2	Link
Sleep Apnea	1999	MIT-BIH PSG [6]	0.6GB	18	1	250Hz	1	250Hz	1	250Hz	1	250Hz	Blood pressure, respiration, cardiac stroke volume, earlobe oximetry	Link
	2007	UCDDB [5]	1.3GB	25	2	128Hz	1	128Hz	2	128Hz	1	128Hz	Airflow, ribcage movements, abdomen movements, oxygen saturation, snoring, body position	Link
Sleep (DREAMS) [3]	2005	D* Subjects	1.1GB	20	3	200Hz		-	2	200Hz	1	200Hz	-	Link
		D* Patients	1.7GB	27	3	200Hz		-	2	200Hz	1	200Hz	-	
		D* Artifacts	0.05GB	20	3	200/ 100/ 50Hz		-	2	200/ 100/ 50Hz	1	200/ 100/ 50Hz	-	
		D* Sleep Spindles	0.05GB	8	3	200/ 100/ 50Hz		-	2	200/ 100/ 50Hz	1	200/ 100/ 50Hz	-	
		D* K-complexes	0.05GB	10	3	200Hz		-	2	200Hz	1	200Hz	-	
		D* REMs	0.04GB	9	3	200Hz		-	2	200Hz	1	200Hz	-	
		D* PLMs	0.6GB	10	3	200/ 50Hz		-	2	200/ 50Hz	1	200/ 50Hz	-	
		D* Apnea	0.8GB	12	3	200Hz	1	200Hz	2	200Hz	1	200Hz	Air flow, abdominal and thoracic inductive plethysmography	
Electrical Stimulation	2021	Gebodh et al. [4]	65GB	20	32	1000/ 2000Hz	1	1000Hz	1	1000Hz		-	Behavioral vigilance and alertness metrics	Link
Freezing of Gaits	2022	Zhang et al. [17]	1.6GB	12	25	1000Hz		-		-	3	1000Hz	Gait acceleration, skin conductance	Link
Emotion Recognition	2012	DEAP [11]	2.7GB	32	32	512Hz		-	4	512Hz	4	512Hz	Video, respiration, plethysmograph, temperature	Link
	2017	DREAMER [8]	0.5GB	23	14	128Hz	2	256Hz		-		-	Video	Need request
Stress and Affect Detection	2018	WESAD [15]	17GB	15		-	1	700Hz		-	1	700Hz	Acceleration, respiration, electrodermal activity, body temperatur, blood volume pulse	Link
Eye Movement	2021	Jaramillo-Gonzalez et al. [7]	3.9GB	4	>0	500Hz		-	>0	500Hz		-	-	Link
Motor Imagery	2008	BCI Competition IV [2]	3.2GB	7	64	1000Hz		-		-		-	-	Link
				9	22	250Hz		-	3	250Hz		-	-	
				9	3	250Hz		-	3	250Hz		-	-	
	2020	BNCI	Multiple datasets. Please refer to the link for detailed information.											Link