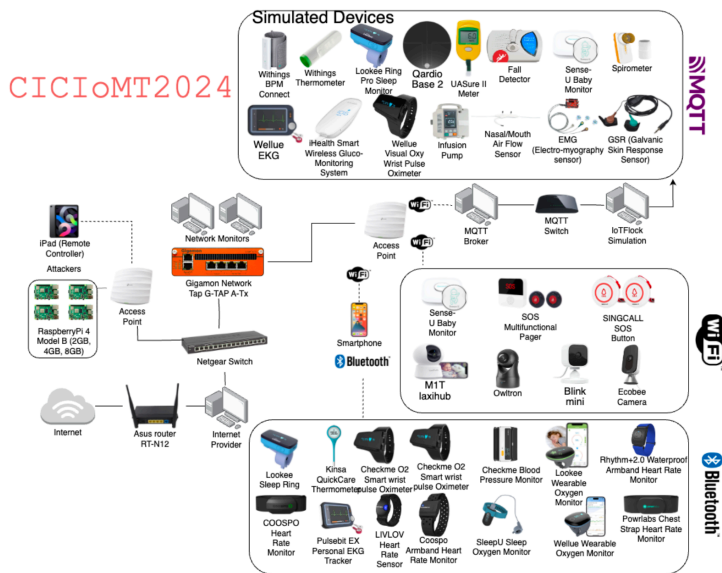


# CICIOmT2024: A Multi-Protocol Dataset for Assessing IoMT Device Security

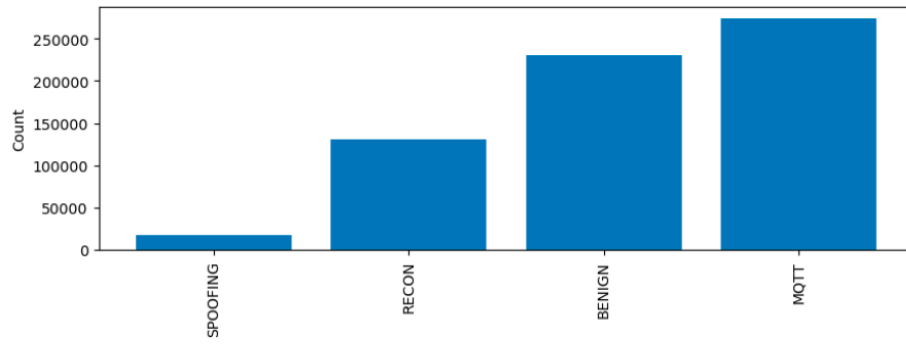
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The main goal of this research is to propose a realistic benchmark dataset to enable the development and evaluation of IoMT security solutions. To accomplish this, 18 attacks were executed against an IoMT testbed composed of 40 IoMT devices (25 real devices and 15 simulated devices), considering the plurality of protocols used in healthcare (e.g., Wi-Fi, MQTT, and Bluetooth). These attacks are categorized into five classes: DDoS, DoS, Recon, MQTT, and spoofing. This effort aims to establish a baseline complementary to the state-of-the-art contributions and supports researchers in investigating and developing new solutions to make healthcare systems more secure using different mechanisms (e.g., machine learning - ML).

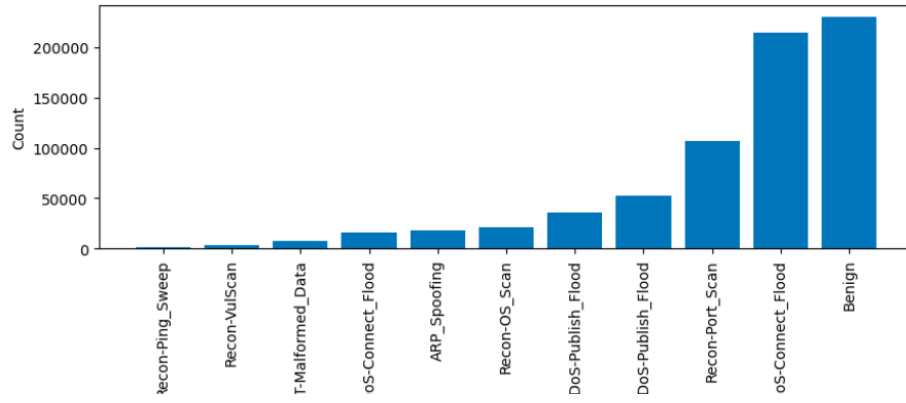


Class	Category	Attack	
BENIGN	-	-	
ATTACK	SPOOFING	ARP Spoofing	
		Ping Sweep	
		Recon VulScan	
	RECON	OS Scan	
		Port Scan	
		MQTT	Malformed Data
			DoS Connect Flood
	DDoS Publish Flood		
	DoS	DoS Publish Flood	
		DDoS Connect Flood	
		DoS TCP	
		DoS ICMP	
		DoS SYN	
		DoS UDP	
		DDoS	DDoS SYN
			DDoS TCP
			DDoS UDP

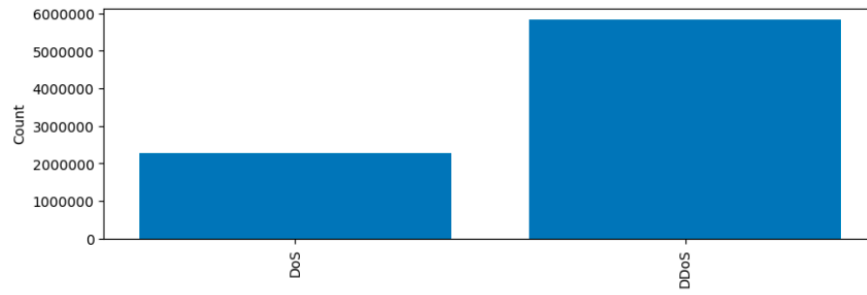




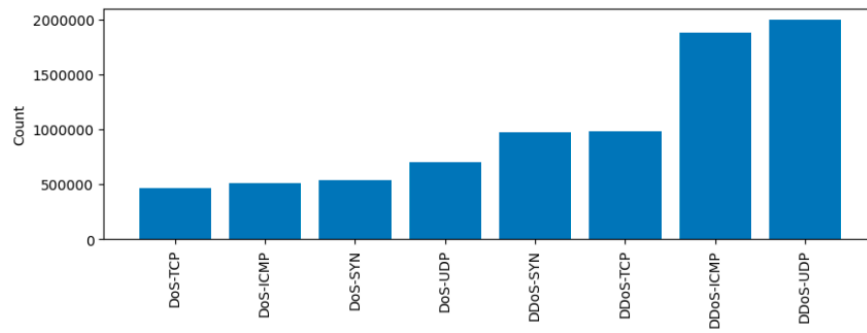
(a) Categorical Classification



(a) Categorical Classification



(b) Multiclass Classification



	mean	std	min	25%	50%	75%	max
Header Length	29962.4717	282363.394	0	2.17	108	19421	9896704
Protocol Type	8.04720327	6.30483218	0	1.05	6	17	17
Duration	64.6369088	7.85306556	0	64	64	64	255
Rate	15744.4895	40008.5463	0	6.42273084	133.141869	19759.2022	2097152
Srate	15744.4895	40008.5463	0	6.42273084	133.141869	19759.2022	2097152
fin_flag_number	0.0051233	0.03415862	0	0	0	0	1
syn_flag_number	0.15721153	0.33687886	0	0	0	0	1
rst_flag_number	0.03951838	0.13929947	0	0	0	0	1
psh_flag_number	0.02217887	0.0965354	0	0	0	0	1
ack_flag_number	0.09566387	0.25214153	0	0	0	0	1
ece_flag_number	2.91E-06	0.0005036	0	0	0	0	0.2
cwr_flag_number	1.92E-06	0.00037966	0	0	0	0	0.2
ack_count	0.02797713	0.17825565	0	0	0	0	11.2
syn_count	0.2938792	0.60364144	0	0	0	0	10.7
fin_count	0.08557531	0.56123908	0	0	0	0	151.74
rst_count	65.8712672	498.281211	0	0	0	0	9576.5
HTTP	0.00086767	0.0284215	0	0	0	0	1
HTTPS	0.00559028	0.06034021	0	0	0	0	1
DNS	0.00015156	0.0052478	0	0	0	0	1
Telnet	1.25E-05	0.00089169	0	0	0	0	0.1
SMTP	1.25E-05	0.00089171	0	0	0	0	0.1
SSH	2.61E-05	0.00271903	0	0	0	0	1
IRC	1.25E-05	0.00089234	0	0	0	0	0.11111111
TCP	0.41487102	0.48990278	0	0	0	1	1
UDP	0.31084898	0.45956644	0	0	0	1	1
DHCP	3.26E-06	0.00098659	0	0	0	0	0.6
ARP	0.00076075	0.01928389	0	0	0	0	1
ICMP	0.27351348	0.44404871	0	0	0	0.99	1
IGMP	4.47E-06	0.0012065	0	0	0	0	0.7
IPv	0.99923925	0.01928389	0	1	1	1	1
LLC	0.99923925	0.01928389	0	1	1	1	1
Tot sum	636.01138	991.6091	42	441	525	567	23467
Min	55.1201614	69.0993765	42	42	50	54	1514
Max	72.3325073	133.609047	42	43.77	50	54	1514
AVG	60.5865132	88.0720219	42	42.0933304	50	54	1514
Std	6.06053694	38.0578569	0	0	0	0	721.15087
Tot size	60.5890934	87.8768798	42	42.24	50	54	1514
IAT	84683677.9	17819169.6	-1.2820613	84679174	84696417	84696902.6	169470846
Number	9.49908609	0.84157738	1	9.5	9.5	9.5	15
Magnitue	10.4382451	3.15807323	9.16515139	9.17497736	10	10.3923048	55.027266
Radius	8.56000977	53.8045034	0	0	0	0	1020.23203
Covariance	2370.54475	19758.8155	0	0	0	0	520437.887
Variance	0.09074362	0.2329791	0	0	0	0	1
Weight	141.527342	21.6618865	1	141.55	141.55	141.55	244.6