Precision Medicine and Artificial Intelligence: A Pilot Study on Deep Learning for Hypoglycemic Events Detection based on ECG.

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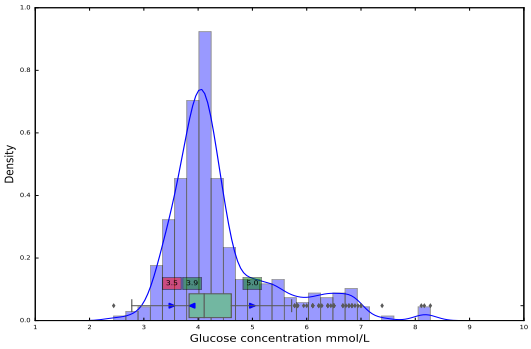
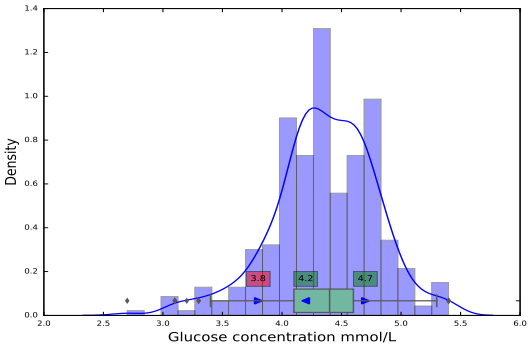
Table 1: Participants' demographics, the eligible participants are highlighted in green.

Participant ID	**Age**	**Gender**	**Weight(kg)**	**Height(cm)**	**BMI**
1	35	M	80	180	24.6
2	29	F	55	162	20.9
3	32	M	81	184	23.9
4	27	F	63	167	21.7
5 (pre-diabetic)	40	M	64	170	22.1
6 (pre-diabetic)	56	M	98	168	34.7
7	58	F	75	158	30
8	26	M	78	183	23.2

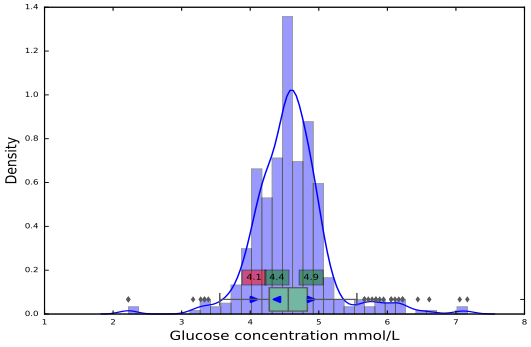
Table 2: Nighttime (midnight to 9 AM) glucose histograms corresponding to all the available participants. The glucose value of the 10^{th} percentile correspoding to participants 5,6,7 and 8 is higher (4.9, 7.1, 5.1 and 4.7 mmol/L) than the expected values of 4.2 mmol/L, thus the 4 participants could not be considered for further analysis.



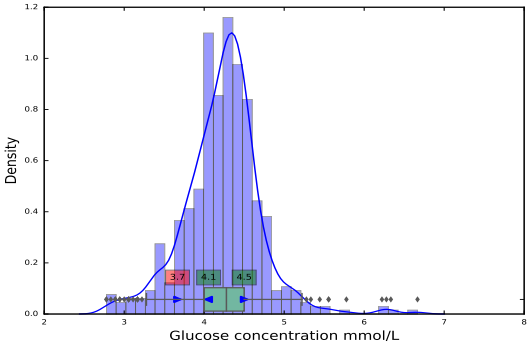
(a) Subject 1, 8 days



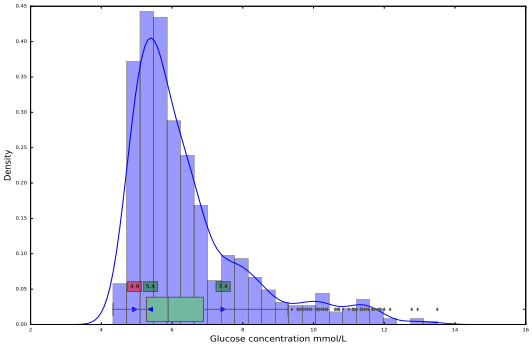
(b) Subject 2, 9 days



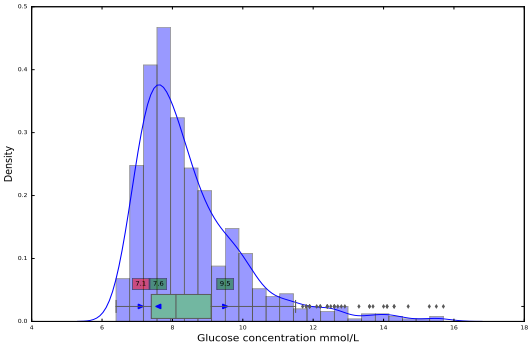
(c) Subject 3, 11 days



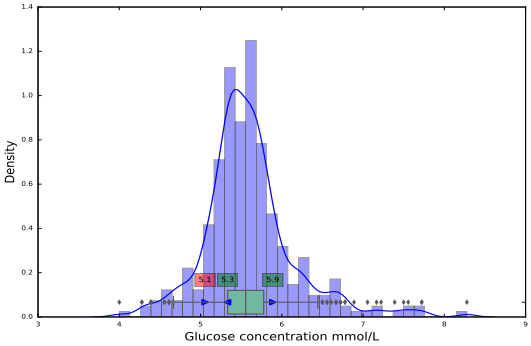
(d) Subject 4, 9 days



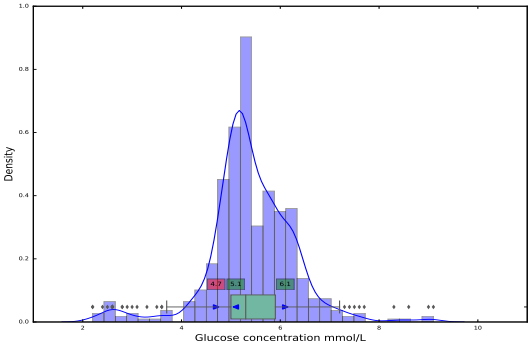
(e) Subject 5, 12 days



(f) Subject 6, 12 days



(g) Subject 7, 6.5 days



(h) Subject 8, 11 days

Table 3: Kruskal-Wallis H-test between pairs of subjects for the extracted ECG features corresponding to Low glucose (a) and Normal glucose (b). *p-value post hoc* column presents the post hoc pairwise test results for multiple comparisons of mean rank sums using Dunn's test.

(a) Low glucose

	Low glucose condition								
Group	**Q_amp**			**R_amp**			**T_amp**		
	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*
S1 <->S2	8285.5	**<0.01**	**<0.01**	13735.6	**<0.01**	**<0.01**	9054.44	**<0.01**	**<0.01**
S1 <->S3	5390.59	**<0.01**	**<0.01**	265.044	**<0.01**	**<0.01**	599.2	**<0.01**	**<0.01**
S1 <->S4	17489.95	**<0.01**	**<0.01**	42.43	**<0.01**	0.136	293.67	**<0.01**	**<0.01**
S2 <->S3	1922	**<0.01**	**<0.01**	14554.1	**<0.01**	**<0.01**	3659.64	**<0.01**	**<0.01**
S2 <->S4	1552.74	**<0.01**	**<0.01**	8475.4	**<0.01**	**<0.01**	3338.05	**<0.01**	**<0.01**
S3 <->S4	10065.08	**<0.01**	**<0.01**	372.38	**<0.01**	**<0.01**	1075.31	**<0.01**	**<0.01**
	QT			**RT_amp**			**T_slope**		
	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*
S1 <->S2	13042.9	**<0.01**	**<0.01**	11073.3	**<0.01**	**<0.01**	365.61	**<0.01**	**<0.01**
S1 <->S3	18328.62	**<0.01**	**<0.01**	2.98	0.084	0.064	7553.51	**<0.01**	**<0.01**
S1 <->S4	1541.51	**<0.01**	**<0.01**	53.89	**<0.01**	0.064	4799.6	**<0.01**	**<0.01**
S2 <->S3	4826.29	**<0.01**	**<0.01**	5560.2	**<0.01**	**<0.01**	3985.8	**<0.01**	**<0.01**
S2 <->S4	11073.53	**<0.01**	**<0.01**	4097.5	**<0.01**	**<0.01**	2501	**<0.01**	**<0.01**
S3 <->S4	12925.27	**<0.01**	**<0.01**	0.73	0.394	0.824	176.85	**<0.01**	**<0.01**

(b) Normal glucose

	Normal glucose condition								
Group	**Q_amp**			**R_amp**			**T_amp**		
	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*
S1 <->S2	9186.49	**<0.01**	**<0.01**	11126.85	**<0.01**	**<0.01**	4100.15	**<0.01**	**<0.01**
S1 <->S3	16000.95	**<0.01**	**<0.01**	3072.64	**<0.01**	**<0.01**	7111.15	**<0.01**	**<0.01**
S1 <->S4	23510.48	**<0.01**	**<0.01**	8962.07	**<0.01**	**<0.01**	3872.39	**<0.01**	**<0.01**
S2 <->S3	3764.68	**<0.01**	**<0.01**	11016	**<0.01**	**<0.01**	338.98	**<0.01**	**<0.01**
S2 <->S4	504.26	**<0.01**	**<0.01**	2698.29	**<0.01**	**<0.01**	0.07	0.798	0.948
S3 <->S4	17293.89	**<0.01**	**<0.01**	2841.9	**<0.01**	**<0.01**	22.37	**<0.01**	**<0.01**
	QT			**RT_amp**			**T_slope**		
	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*	H	*p-value*	*p-value post hoc*
S1 <->S2	10322.81	**<0.01**	**<0.01**	6780.41	**<0.01**	**<0.01**	1644.39	**<0.01**	**<0.01**
S1 <->S3	18477.87	**<0.01**	**<0.01**	5800.23	**<0.01**	**<0.01**	985.03	**<0.01**	**<0.01**
S1 <->S4	23959.46	**<0.01**	**<0.01**	7616.6	**<0.01**	**<0.01**	1520.74	**<0.01**	**<0.01**
S2 <->S3	641.89	**<0.01**	**<0.01**	370	**<0.01**	**<0.01**	180.86	**<0.01**	**<0.01**
S2 <->S4	461.3	**<0.01**	**<0.01**	87.68	**<0.01**	**<0.01**	0.94	0.332	**<0.01**
S3 <->S4	58.07	**<0.01**	**<0.01**	379.15	**<0.01**	**<0.01**	175	**<0.01**	**<0.01**

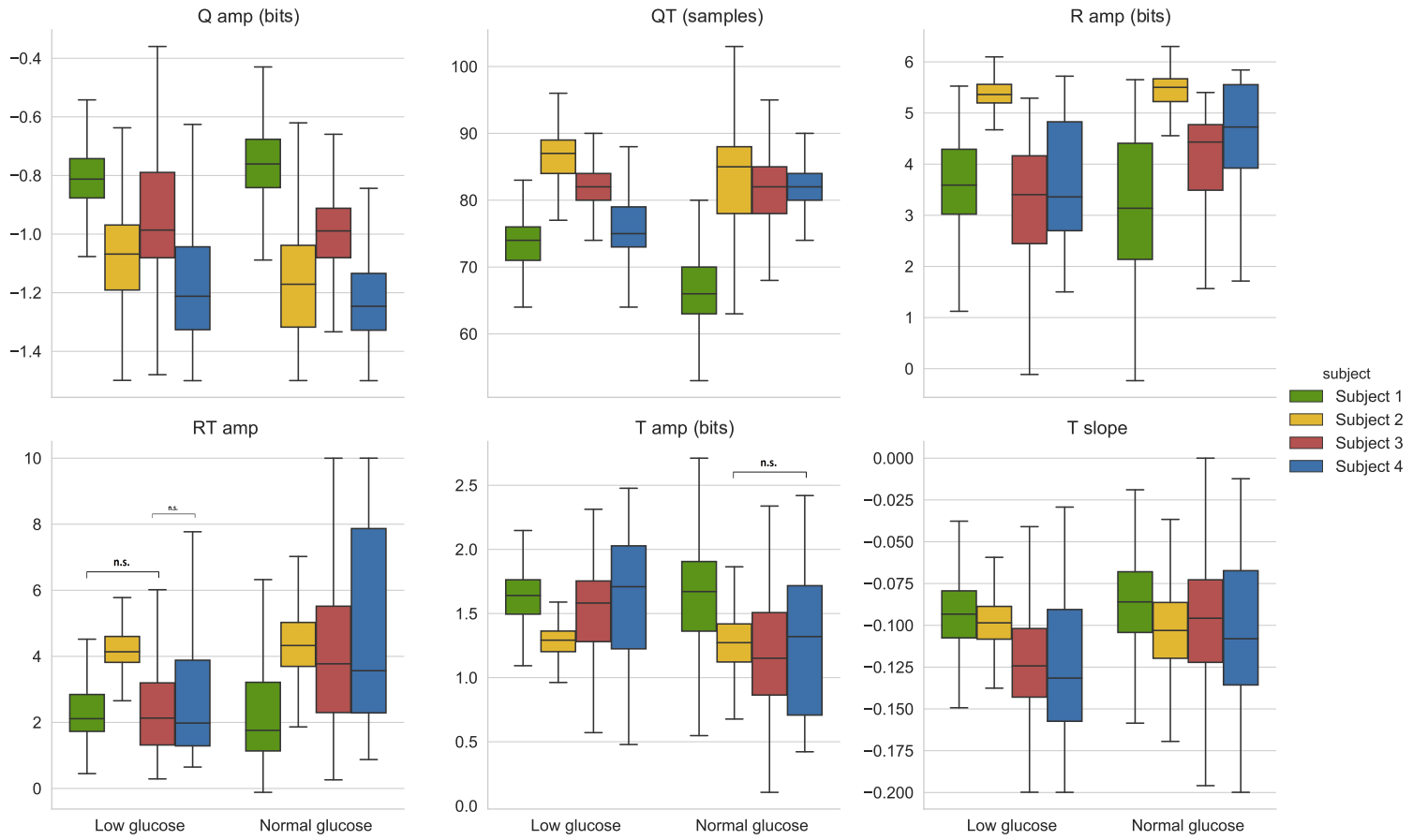


Figure 1: Box plots for the extracted ECG features during Low and Normal glucose levels for every participant. A multi-way Kruskal-Wallis H-test was performed for every ECG parameter for the low and normal glucose condition separately. The only non-significant differences between the groups are indicated in the plot n.s.

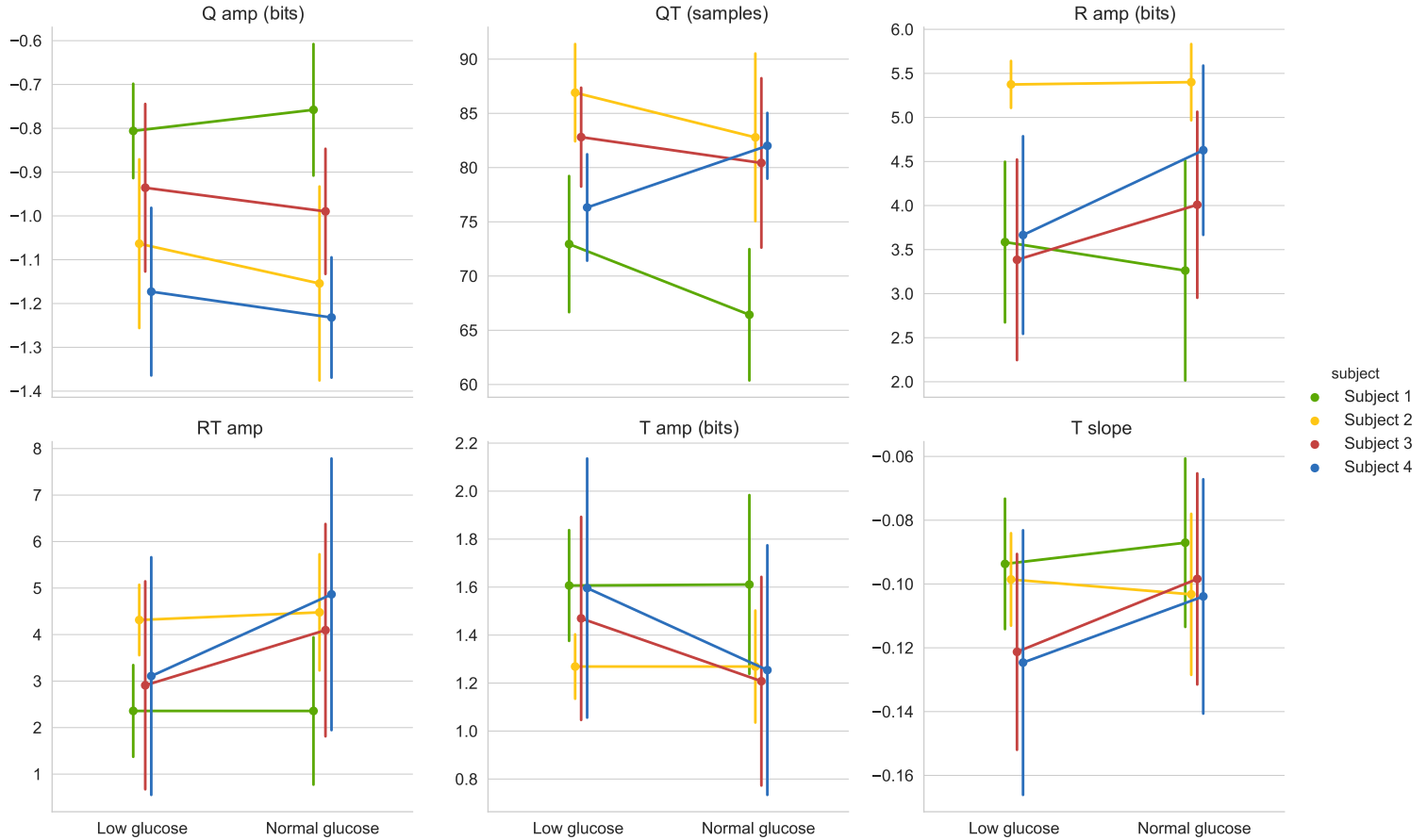
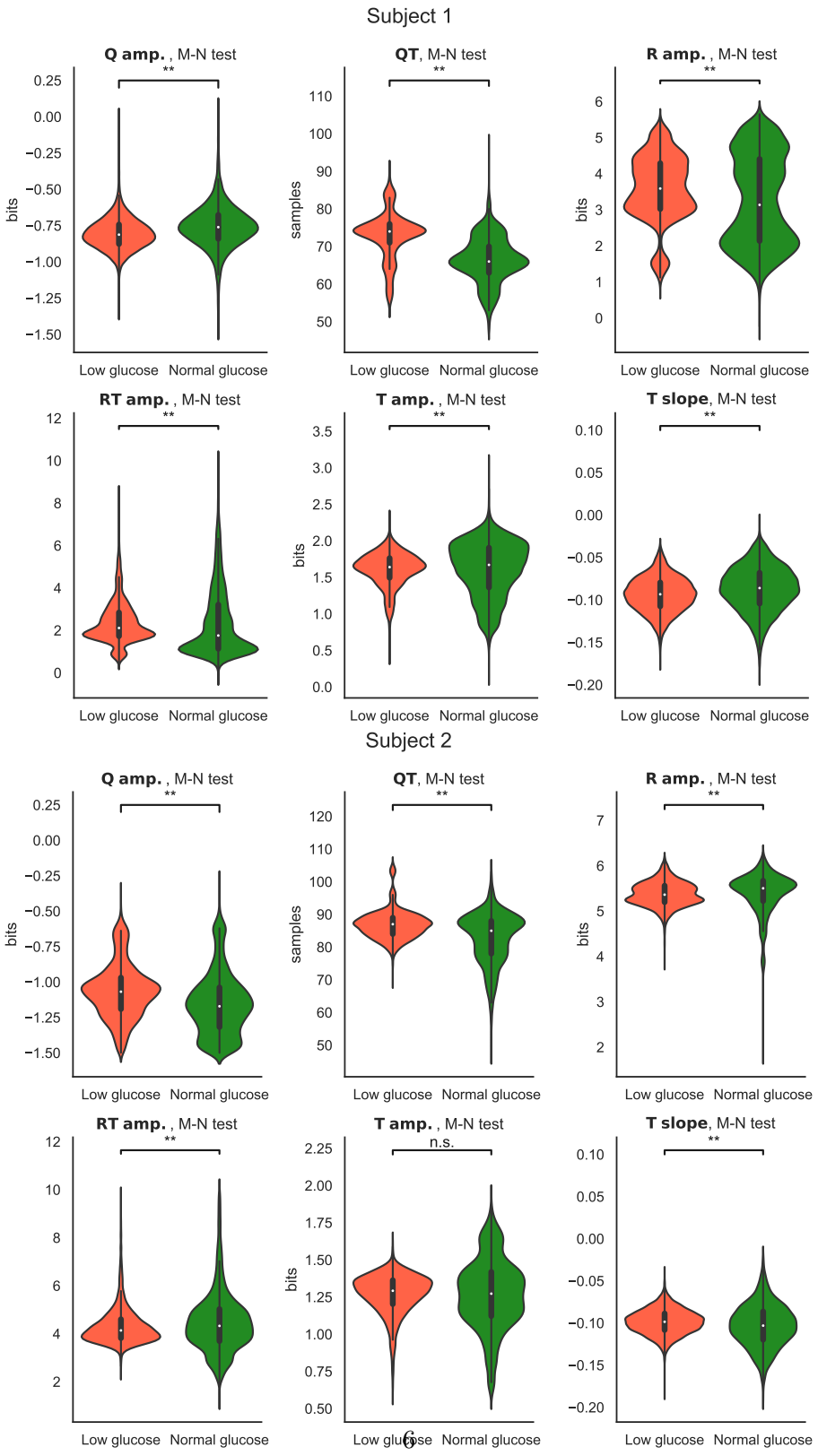


Figure 2: Point plots for the extracted ECG features during Low and Normal glucose levels for every participant, showing the relationship between the mean of every ECG feature for low and normal glucose levels.


Subject 1
Q amp. , M-N test
QT, M-N test
R amp. , M-N test
RT amp. , M-N test
T amp. , M-N test
T slope, M-N test
**
bits
samples
Low glucose
Normal glucose
Subject 2
Q amp. , M-N test
QT, M-N test
R amp. , M-N test
RT amp. , M-N test
T amp. , M-N test
T slope, M-N test
n.s.

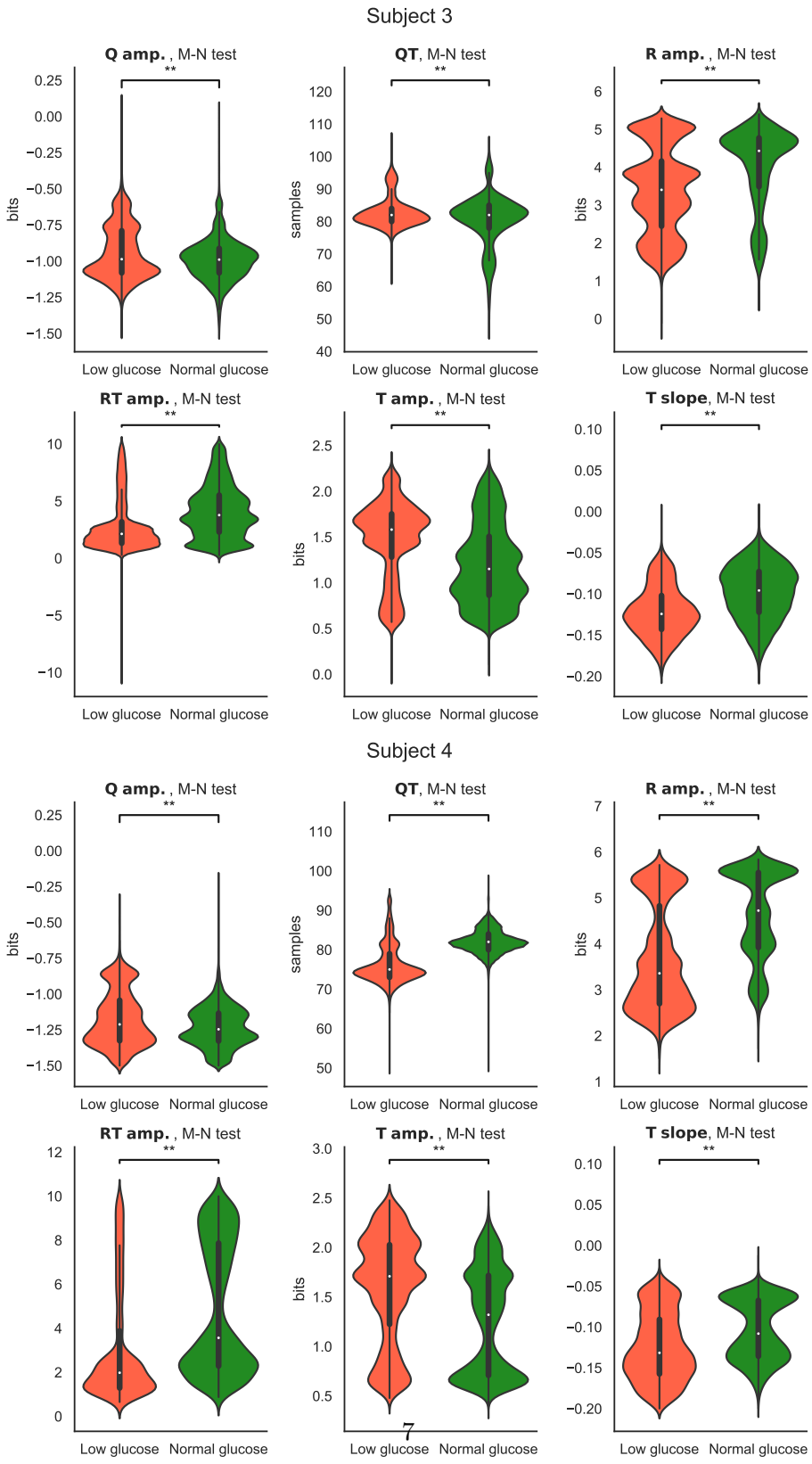


Figure 3: Mann-Whitney rank test on the extracted ECG parameters for each subject, figures a-d. All the statistical tests showed significant differences between the groups (low vs normal glucose level)