Estágio de Verão LSIA 2025

APRESENTAÇÃO FINAL

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Orientadores:
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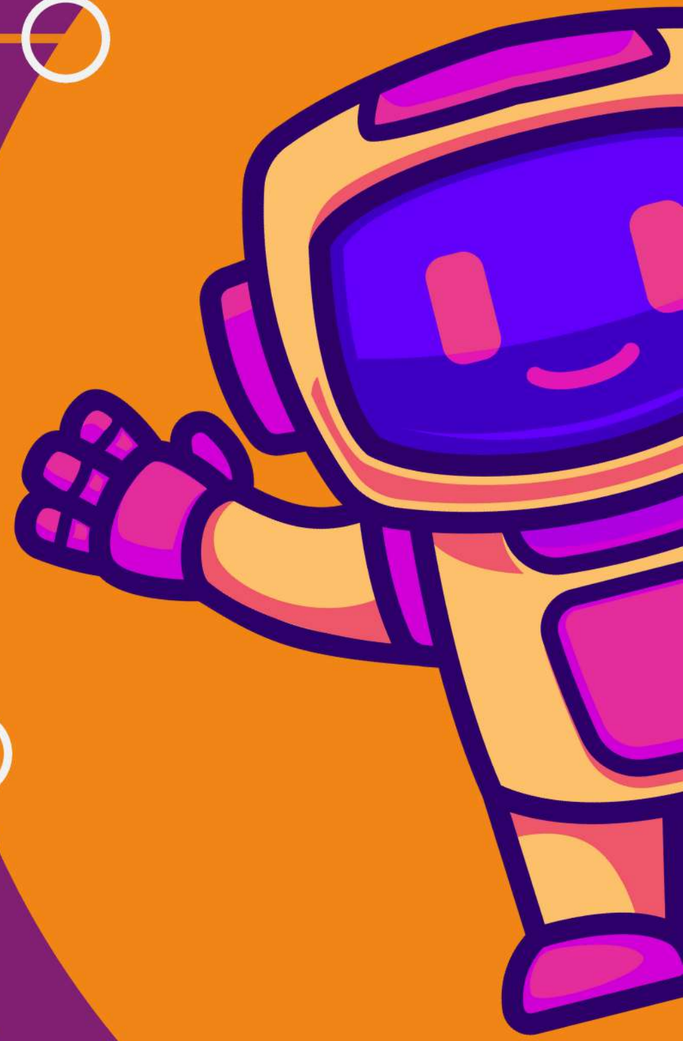
Gabriel Schleder
Yasmin Watanabe

O QUE TEMOS FEITO...

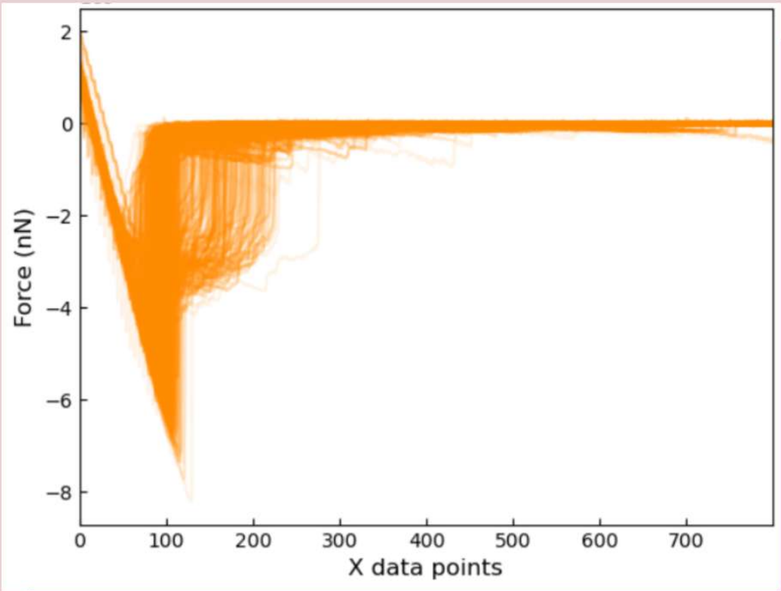
MÉTODO
DTW-SOM

DADOS
Curvas de força
de AFM

DATASETS
4 datasets com diferentes
pontas e substratos

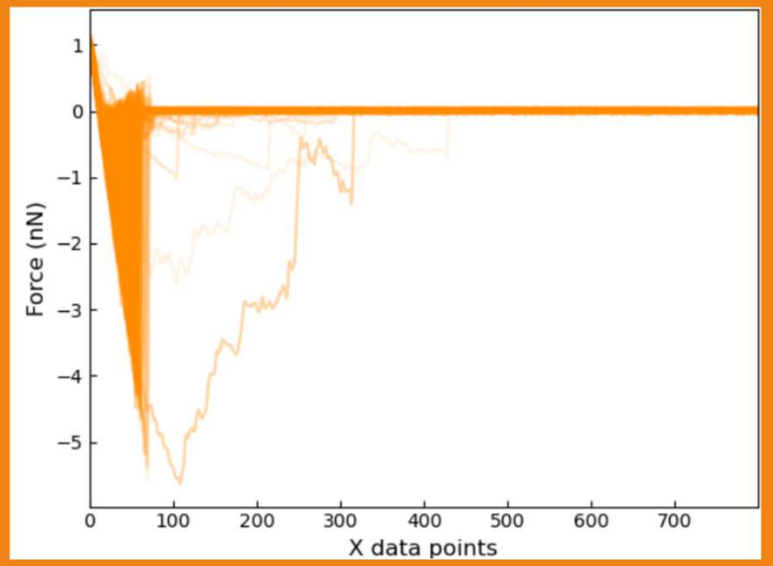


DATASET AU-AU

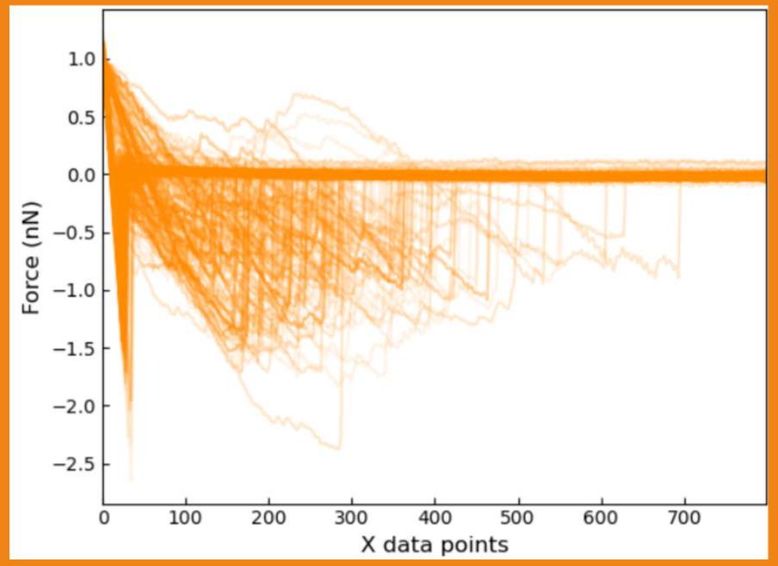


Num. Teste	Dimensões	Corte	Estrutura	Quant. Séries	Quant. Épocas	Ambiente	Tempo	Erro
1	3x3	800	grid_four	100	10	Vs Code	3h04	4,90
2	3x3	800	grid_four	100	50	HPC	3h11	4,20
3	2x2	800	grid_four	100	50	HPC	1h25	5,87
4	3x3	400	grid_four	100	50	HPC	1h39	4,26
5	2x2	450	grid_four	100	50	HPC	0h54	6,21
6	3x3	350	grid_four	200	50	HPC	2h30	5,35
7	3x3	350	grid_four	100	50	HPC	0h45	4,71
8	3x3	800	grid_eight	100	50	HPC	2h46	3,95
9	2x2	800	grid_eight	100	50	HPC	2h27	5,44
10	3x3	400	grid_eight	100	50	HPC	1h23	4,73
11	3x3	800	honeycomb	100	50	HPC		
12	3x3	800	grid_eight	200	50	HPC	10h12	3,75
13	2x3	800	grid_four	100	50	HPC	2h54	5,04
14	3x2	800	grid_four	100	50	HPC		
15	2x2	400	grid_eight	100	50	HPC	0h45	5,56
16	2x2	800	grid_eight	100 (A)	50	HPC	8h56	4,95
17	3x3	800	grid_eight	100 (A)	50	HPC	6h55	4,41
18.1	2x2	800	grid_eight	100	50	HPC	2h12	6,22
18.2	3x3	800	grid_eight	100	50	HPC	1h05	3,07
19.1	2x2	800	grid_eight	100	50	HPC	2h12	6,22
19.2	2x2	800	grid_eight	100	50	HPC	1h06	4,58
20.1	2x2	800	grid_eight	100 (A)	50	HPC	3h41	4,95
20.2	3x3	800	grid_eight	100 (A)	50	HPC	2h28	2,93
21	3x3	800	func_neighbor	100	50	HPC		

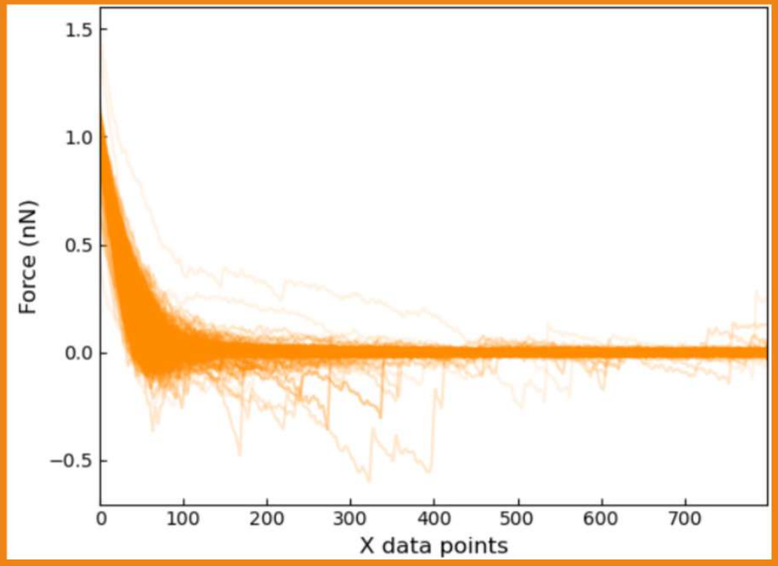
OUTROS DATASETS



AU- SIO2

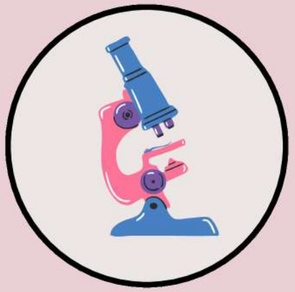


LIG- SIO2



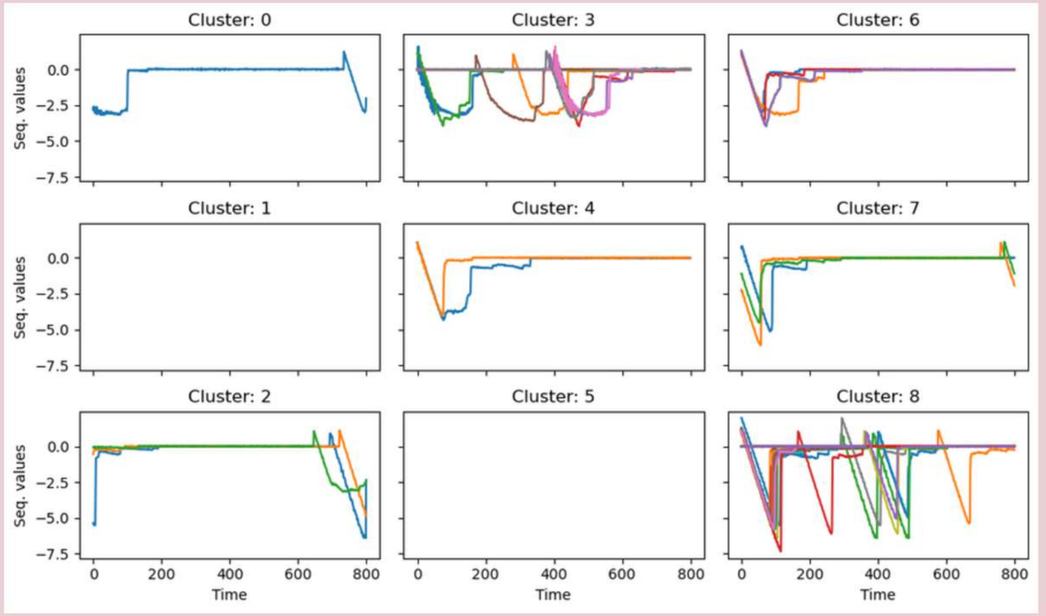
LIG- CL

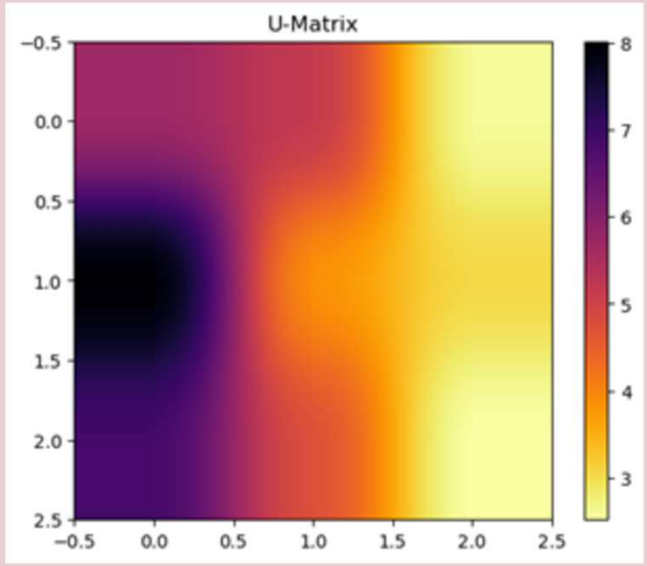
DATASET AU-AU

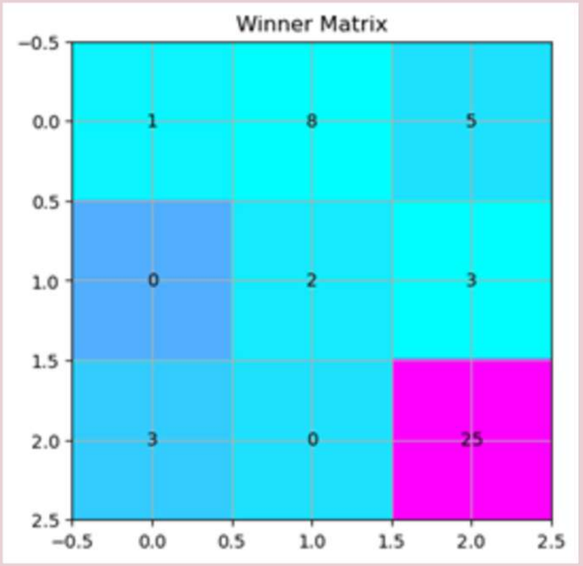


Duração: 6h55min

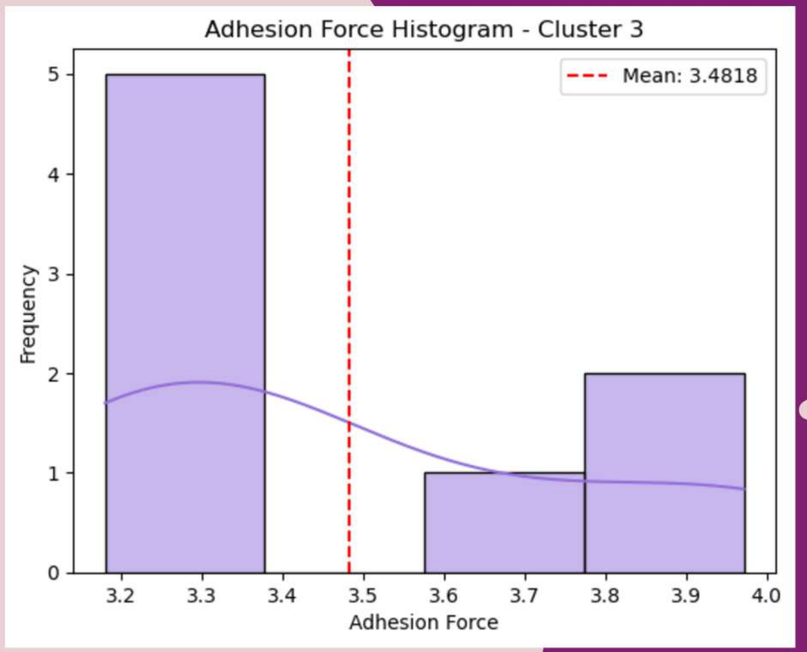
Erro: 4,41

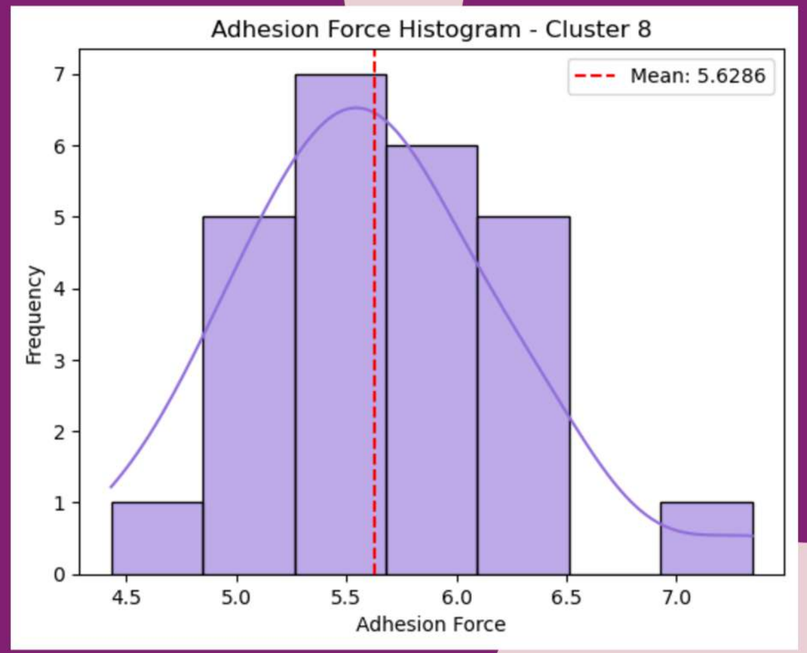






DATASET AU-AU

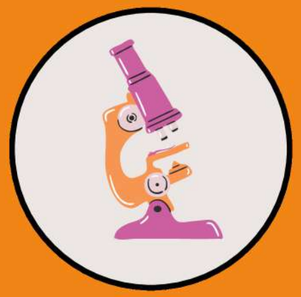




Cluster 8: distribuição normal - o valor esperado para a força de adesão é de ~5,5 nN!

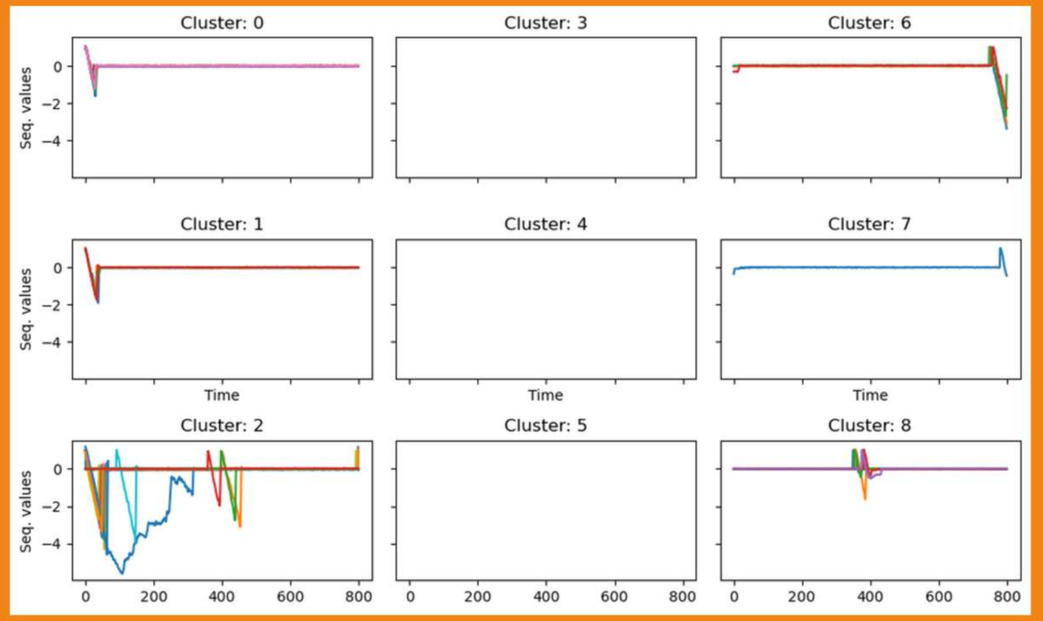
Cluster 5: padrão não identificado - ruídos ou erros experimentais

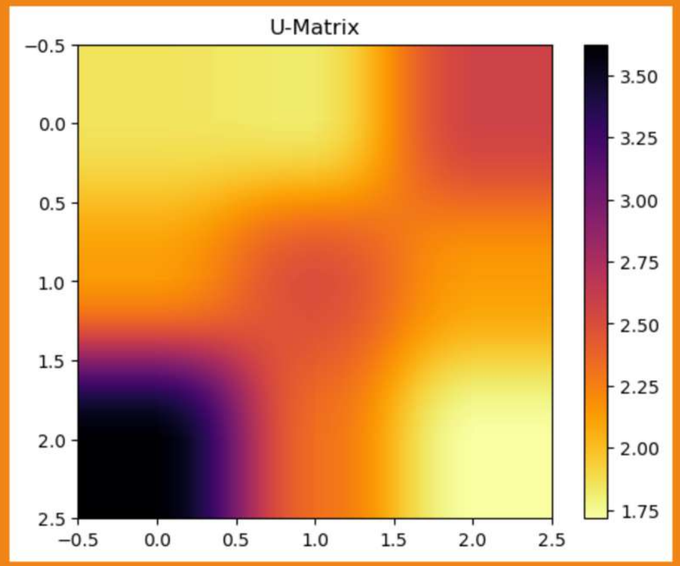
DATASET AU-SIO2

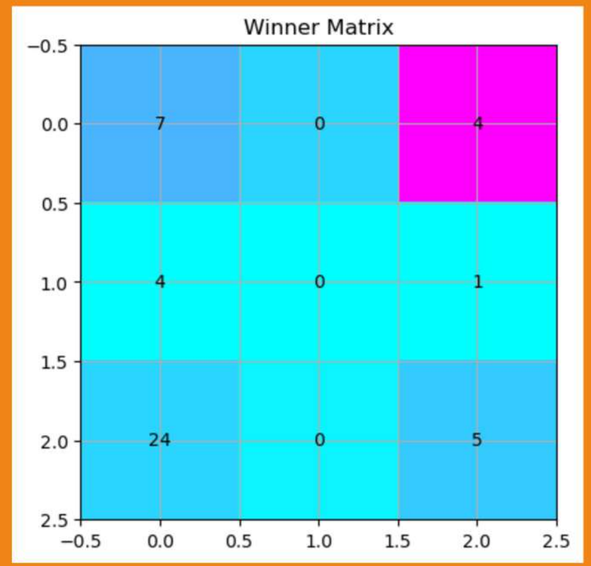


Duração: 9h23min

Erro: 1,74



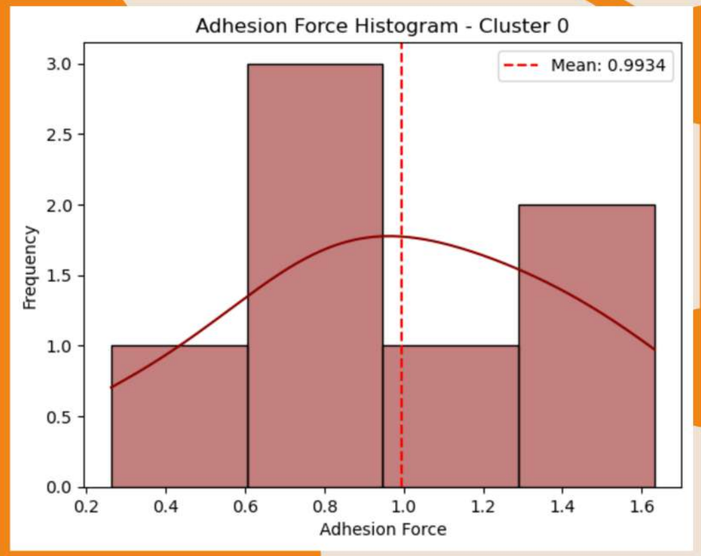


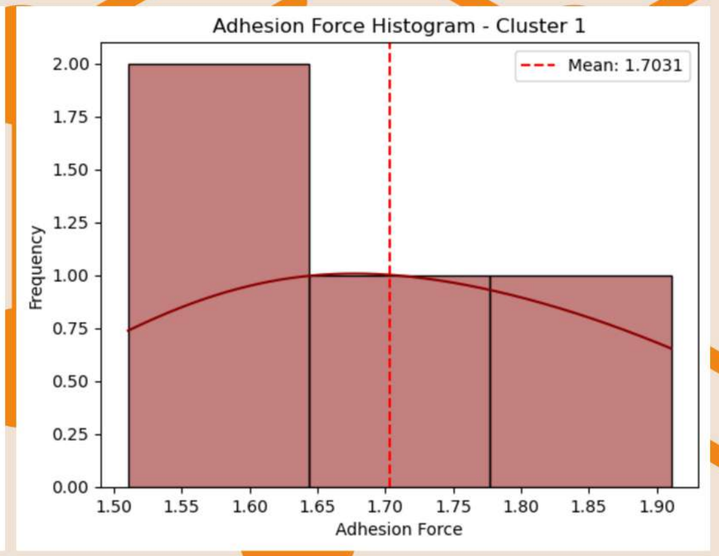


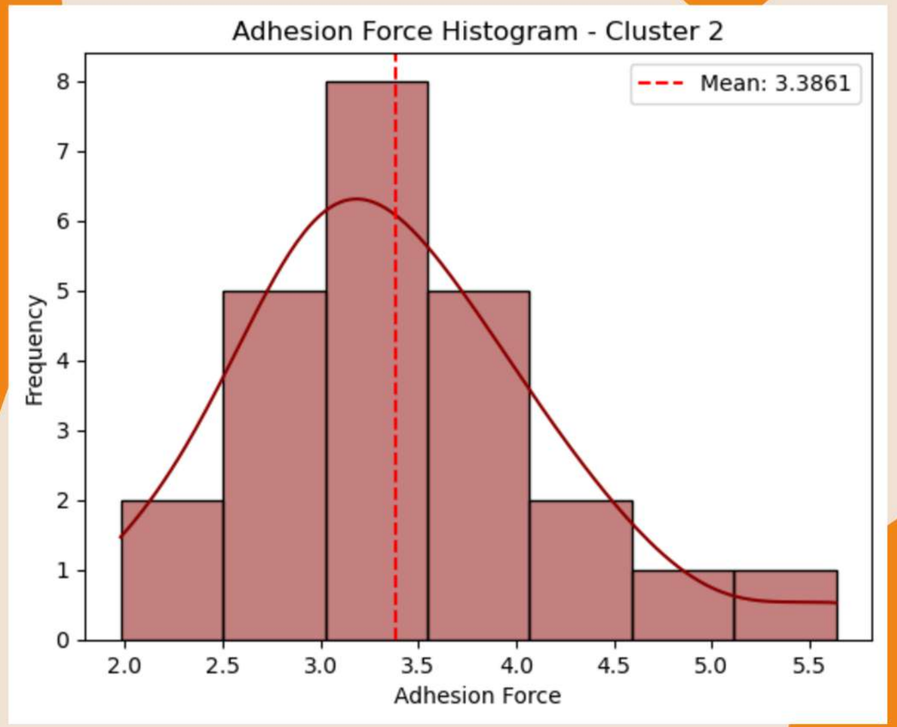
DATASET AU-SIO2

Cluster 2: distribuição normal - o valor esperado para a força de adesão é de ~3,4 nN!

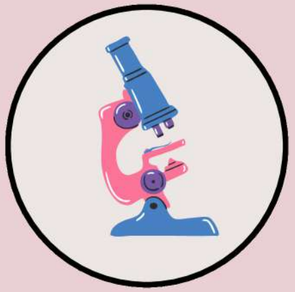
Clusters 0 e 1: padrão não identificado - ruídos ou erros experimentais





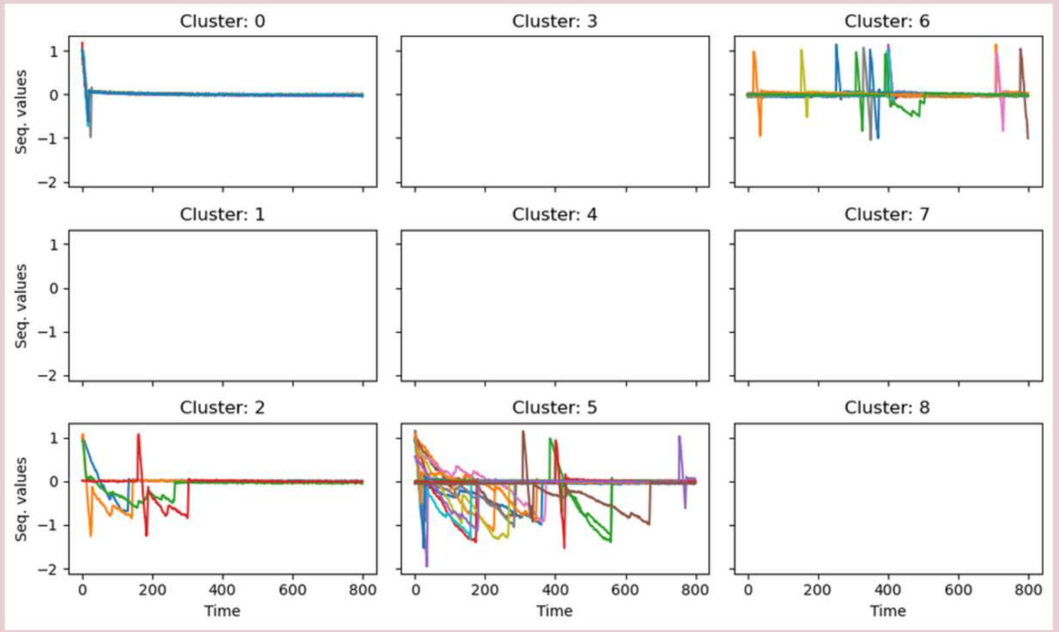


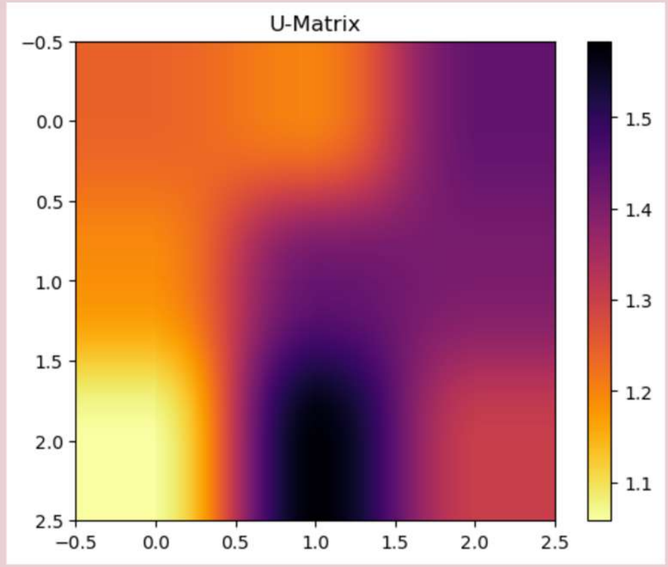
DATASET LIG- SIO2

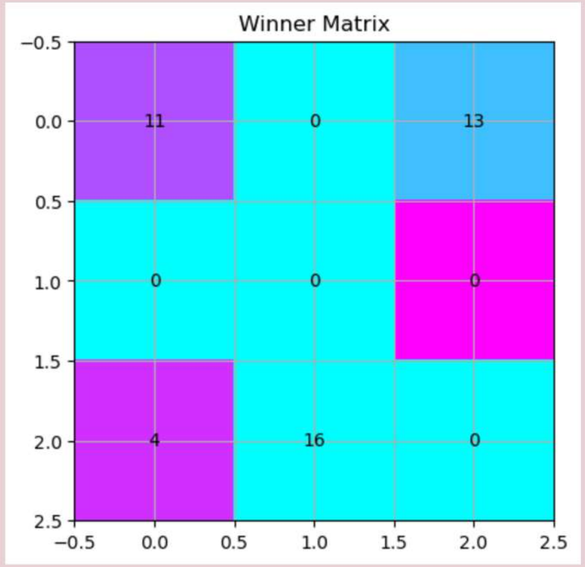


Duração: 6h31min

Erro: 1,24

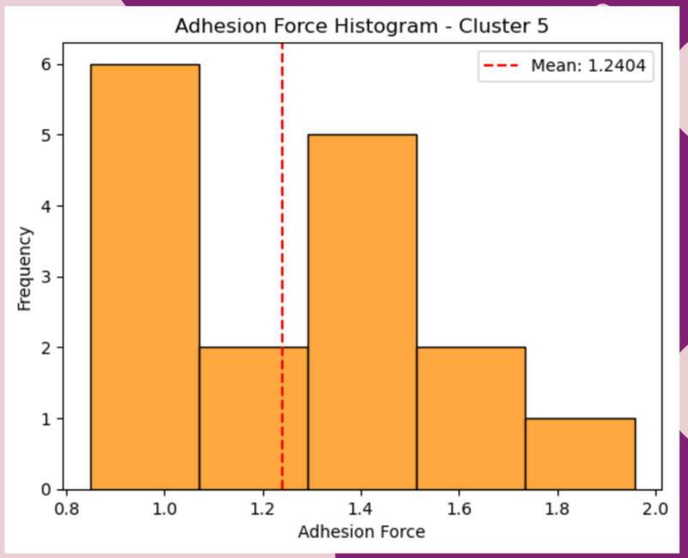


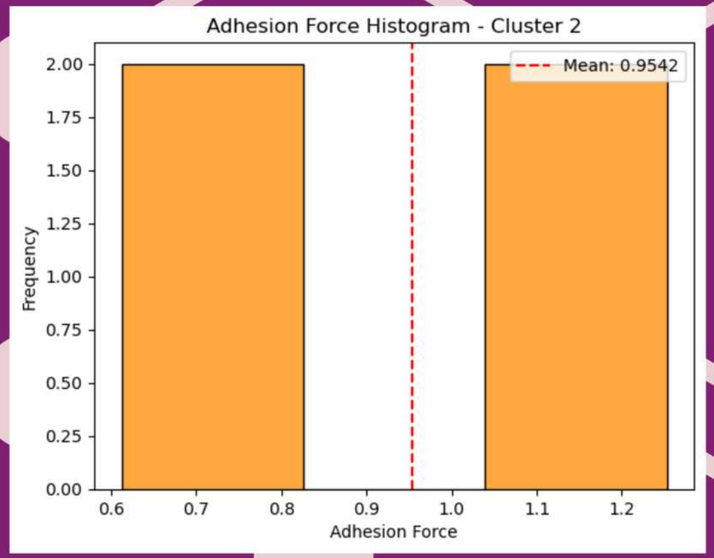


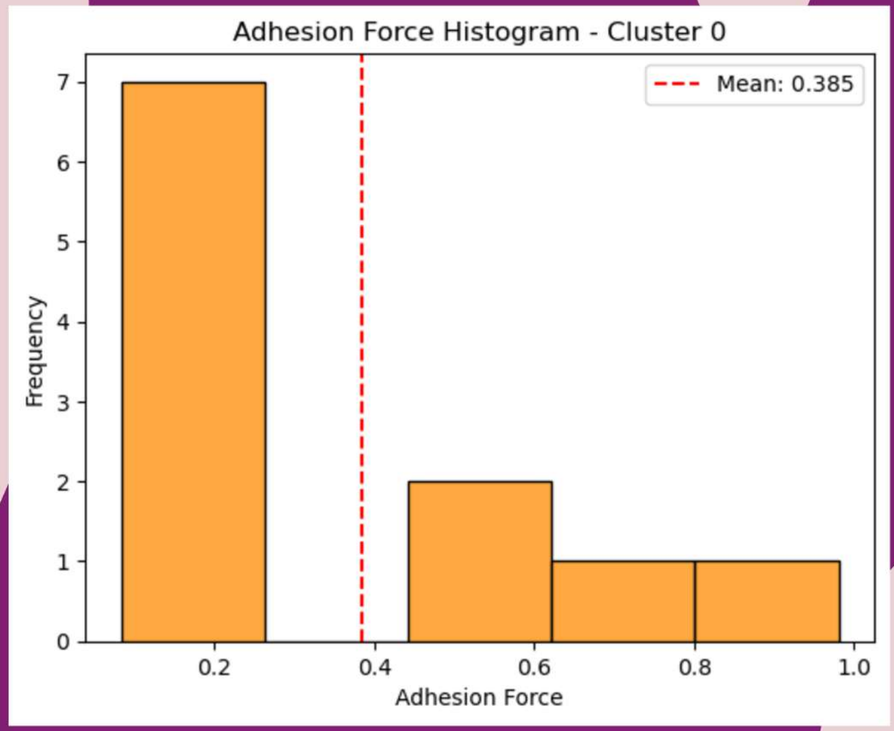


DATASET LIG-SIO2

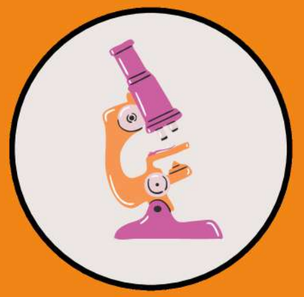
Clusters 2 e 5 são similares, sendo que o primeiro possui menor força de adesão.
Cluster 0 é o mais homogêneo.





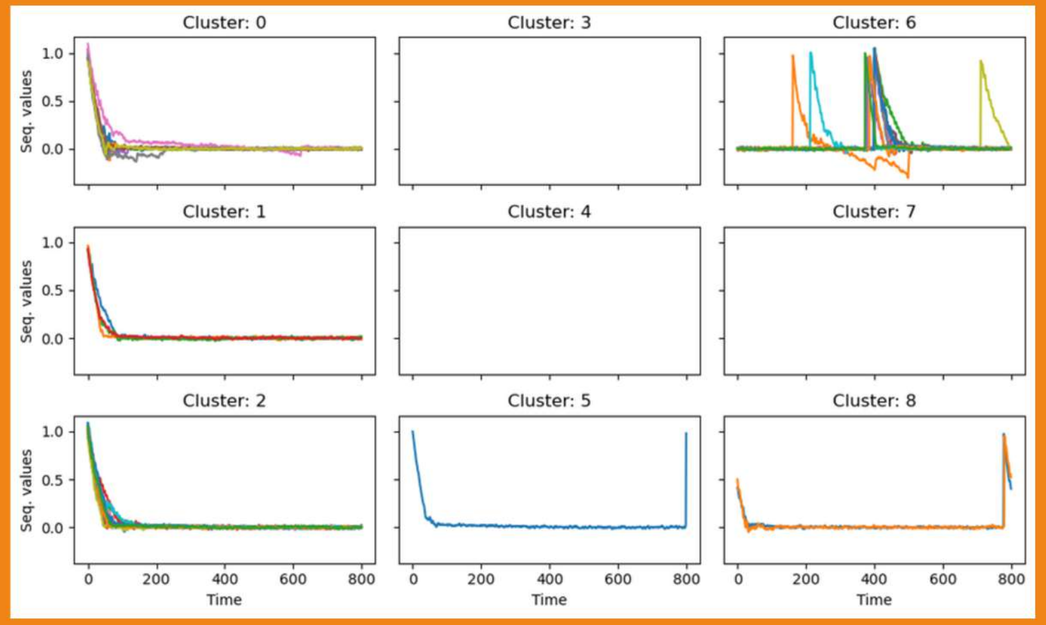


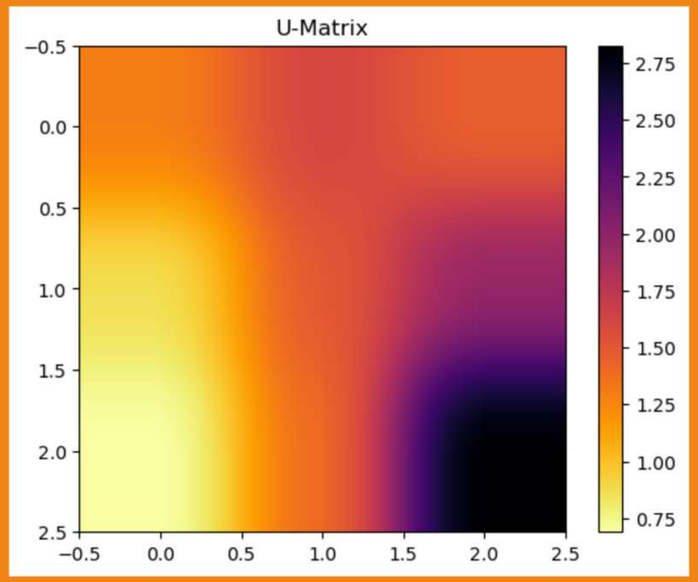
DATASET LIG-CL

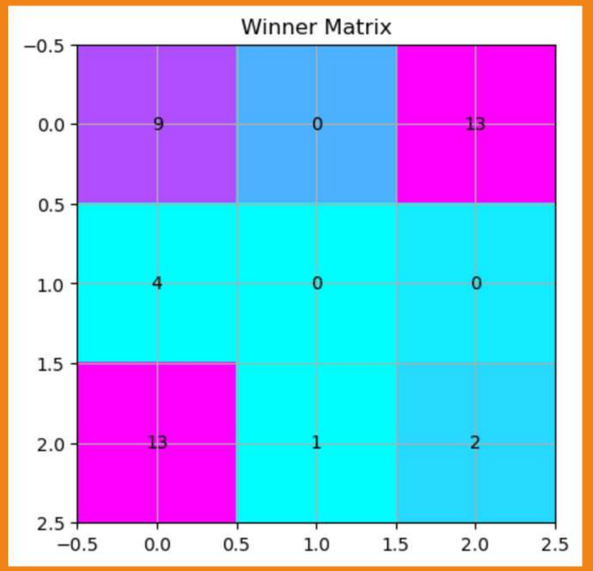


Duração: 8h

Erro: 0,24

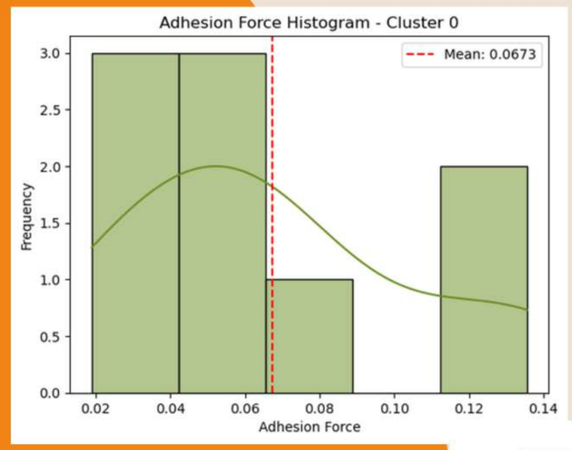


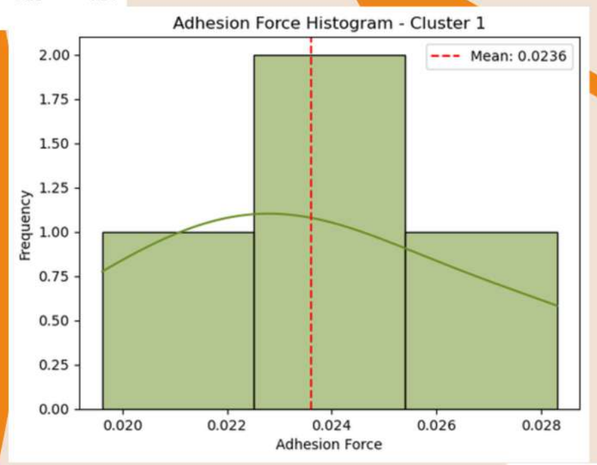


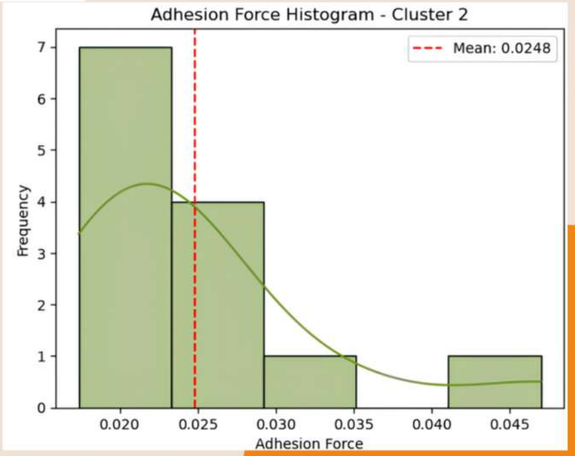


DATASET LIG-CL

Médias similares ~ interação entre grupos similares! (hidrocarbonetos e oxigenados)
Clusterização baseada em ruído.



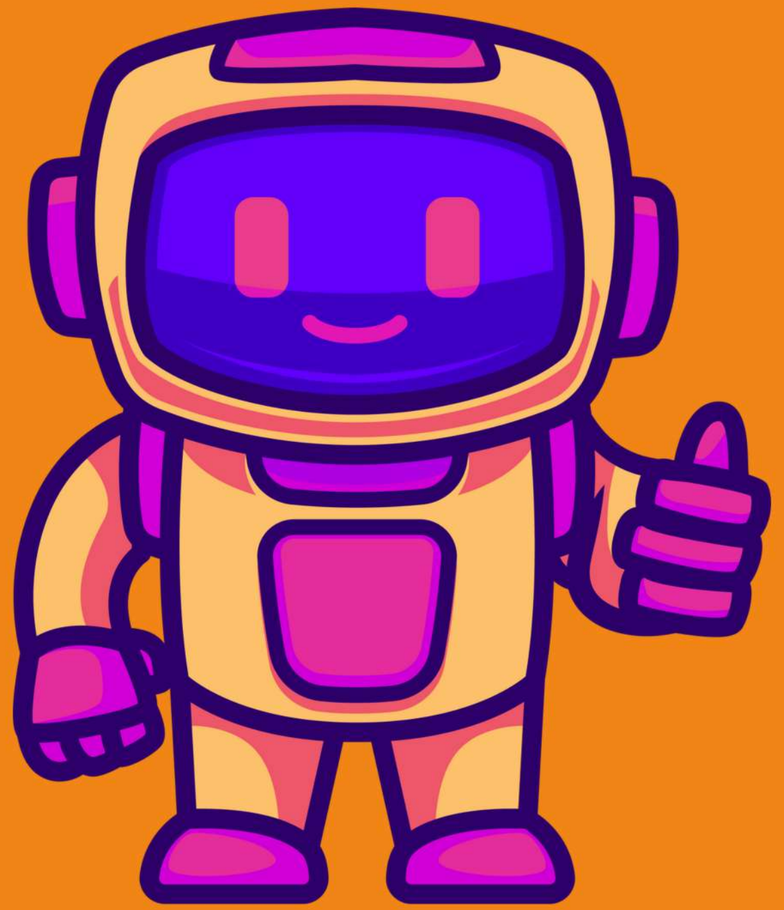




CONCLUSÕES

PRINCIPAIS APRENDIZADOS

- Redes neurais
- Motif Discovery
- Aprendizado não-supervisionado (SOM)
- Métodos para séries temporais (DTW)



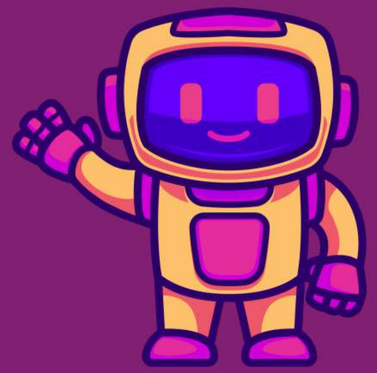
O QUE CONCLUIMOS?

O método DTW-SOM, apesar das suas limitações, apresenta-se como uma alternativa plausível para a clusterização de curvas de força de AFM.

OBRIGADA PELO VERÃO!

Júlia Guedes & Yasmin Shimizu

GitHub

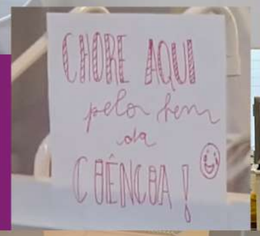


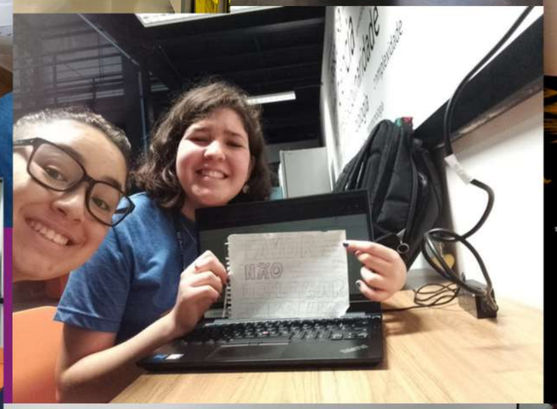
Playlist

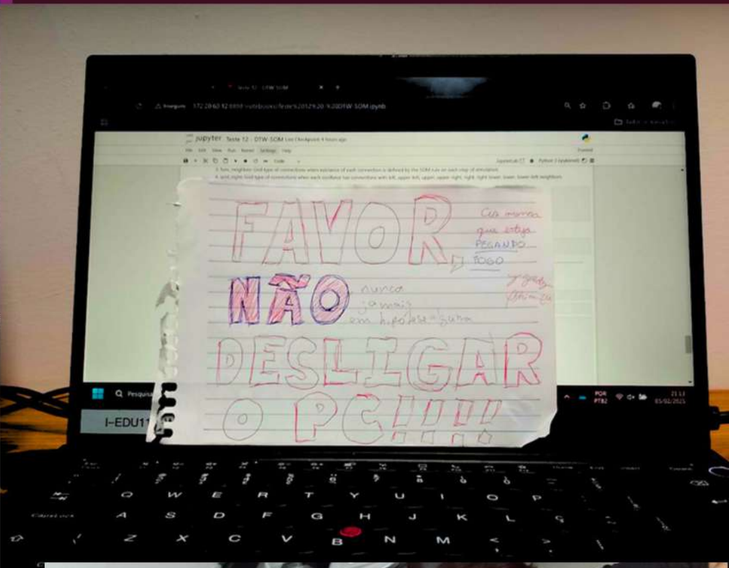
LABecê

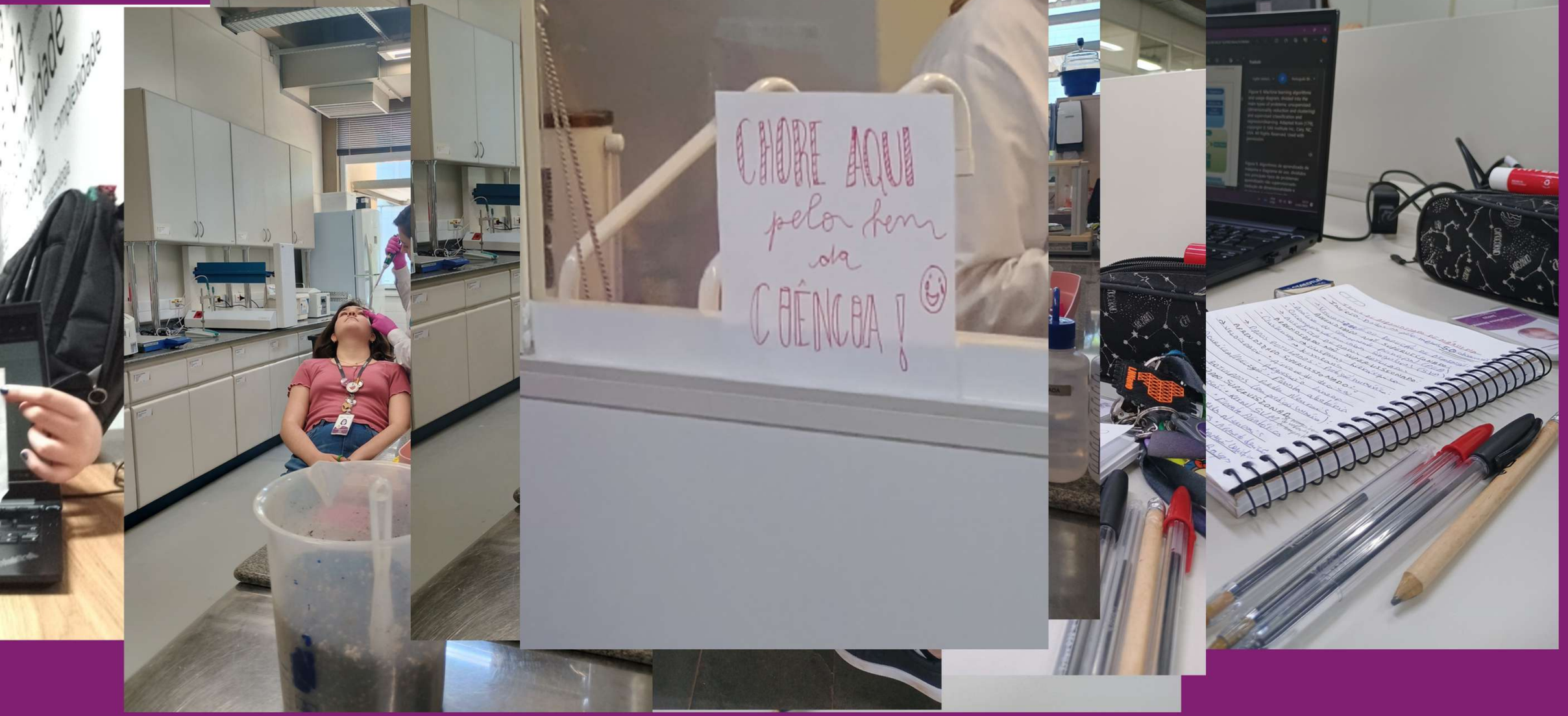
boas tardes de laboratório e programação

minbsz • 1 salvamento • 117 músicas, cerca de 6h 30min








CHORE AQUI
pelo bem
da
CIÊNCIA !