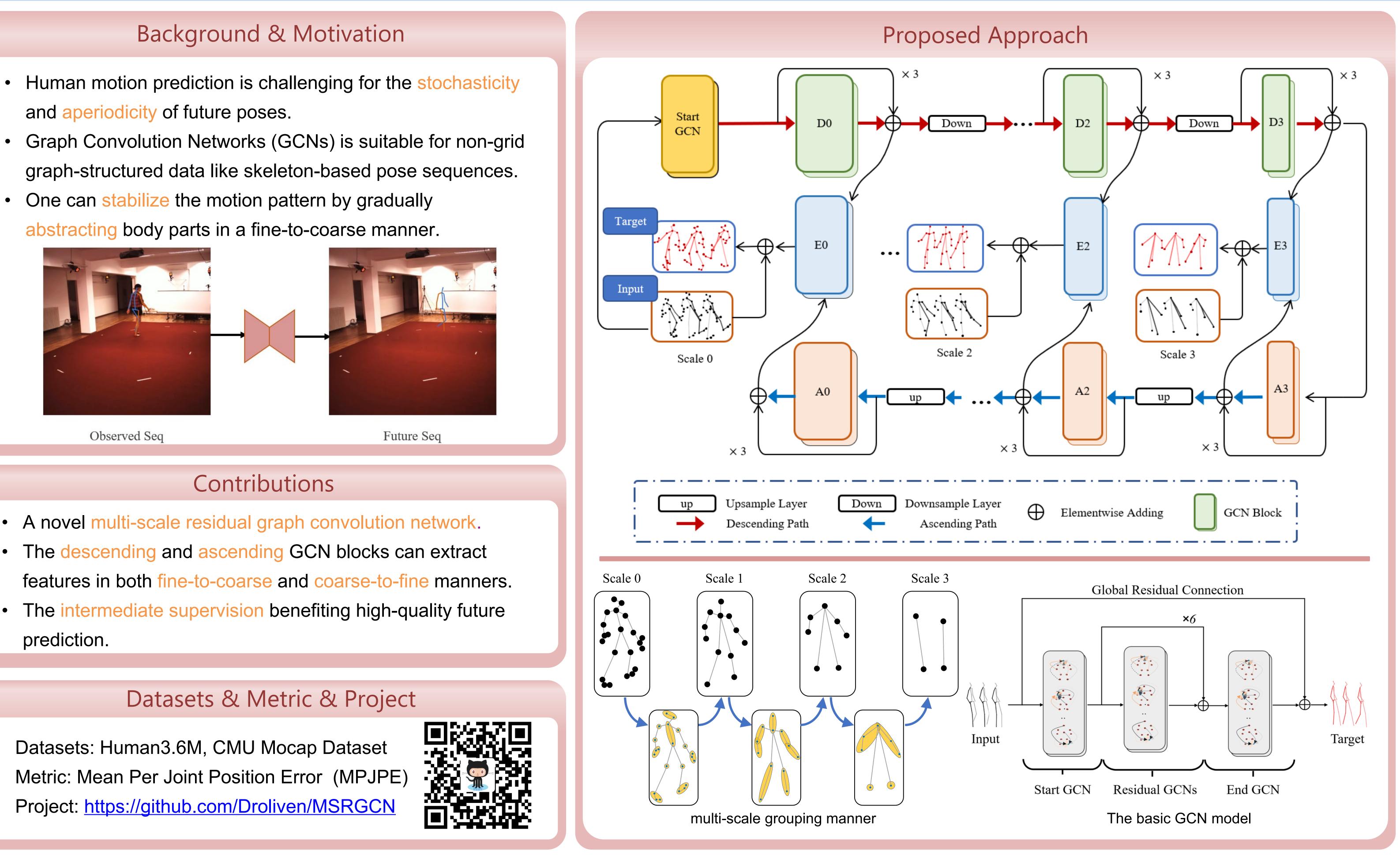
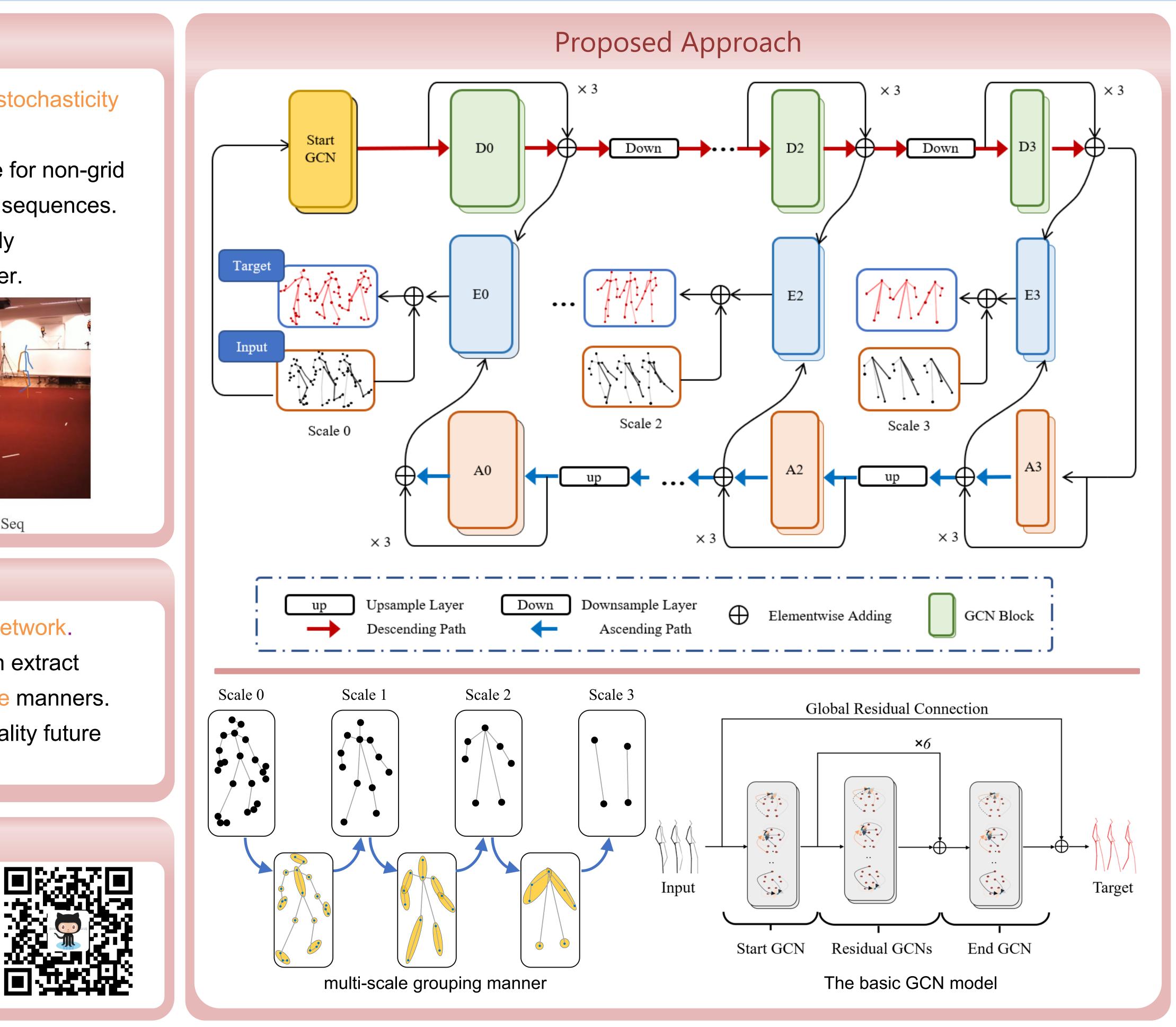


- Human motion prediction is challenging for the stochasticity and aperiodicity of future poses.
- One can stabilize the motion pattern by gradually



- A novel multi-scale residual graph convolution network.
- The descending and ascending GCN blocks can extract
- The intermediate supervision benefiting high-quality future prediction.

- Datasets: Human3.6M, CMU Mocap Dataset
- Metric: Mean Per Joint Position Error (MPJPE)
- Project: <u>https://github.com/Droliven/MSRGCN</u>



Key References

MSR-GCN: Multi-Scale Residual Graph Convolution Networks for Human Motion Prediction

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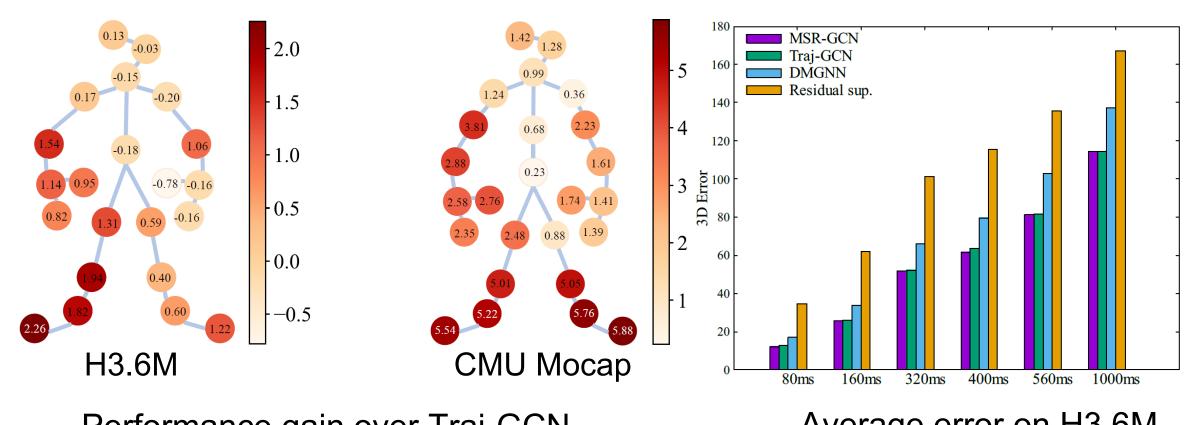
[Traj-GCN] Mao W, Liu M, Salzmann M, et al. : Learning trajectory dependencies for human motion prediction. ICCV, 2019. [DMGNN] Li M, Chen S, Zhao Y, et al. : Dynamic multiscale graph neural networks for 3d skeleton based human motion prediction. CVPR, 2020. [Residual sup.] Martinez J, Black M J, Romero J.: On human motion prediction using recurrent neural networks. CVPR, 2017.

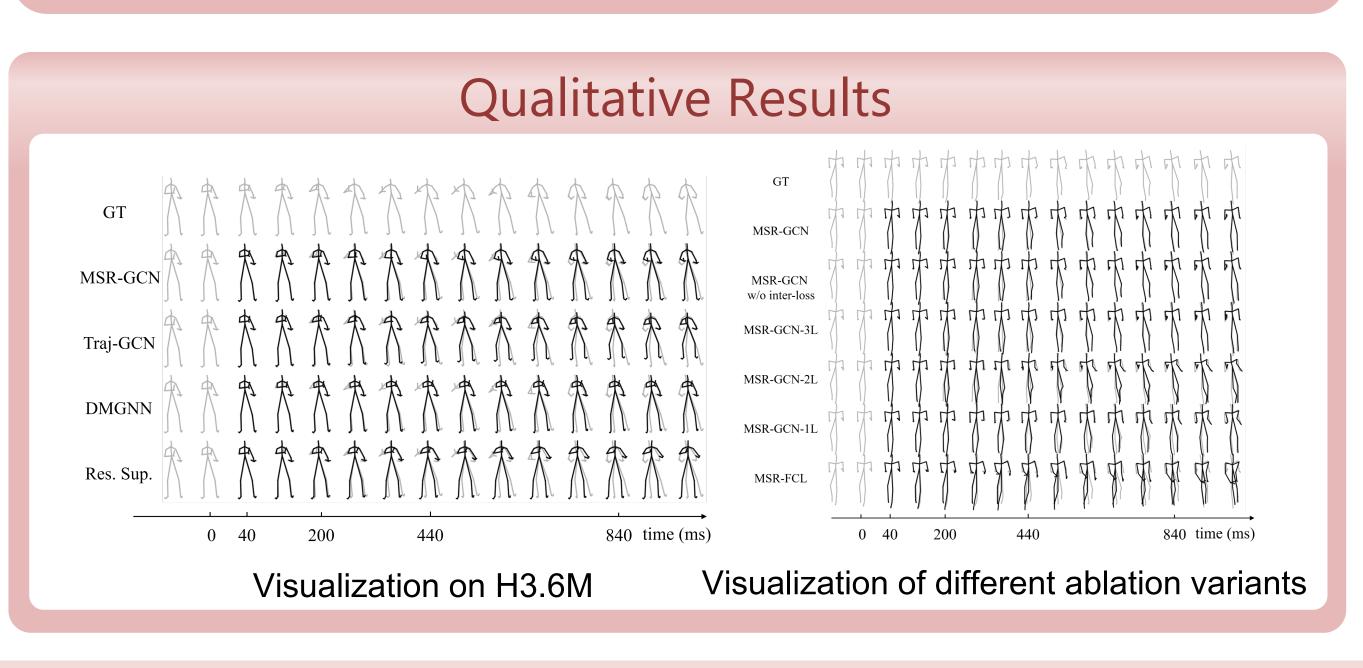
Short-term errors on H3.6M

scenarios	walking				eating					sm	oking		discussion			
millisecond (ms)	80	160	320	400	80	160	320	400	80	160	320	400	80	160	320	400
Residual sup. [34]	29.36	50.82	76.03	81.51	16.84	30.60	56.92	68.65	22.96	42.64	70.14	82.68	32.94	61.18	90.92	96.19
DMGNN [27]	17.32	30.67	54.56	65.20	10.96	21.39	36.18	43.88	8.97	17.62	32.05	40.30	17.33	34.78	61.03	69.80
Traj-GCN [33]	12.29	23.03	39.77	46.12	8.36	16.90	33.19	40.70	7.94	16.24	31.90	38.90	12.50	27.40	58.51	71.68
MSR-GCN	12.16	22.65	38.64	45.24	8.39	17.05	33.03	40.43	8.02	16.27	31.32	38.15	11.98	26.76	57.08	69.74
scenarios	directions				greeting				phoning				posing			
millisecond (ms)	80	160	320	400	80	160	320	400	80	160	320	400	80	160	320	400
Residual sup. [34]	35.36	57.27	76.30	87.67	34.46	63.36	124.60	142.50	37.96	69.32	115.00	126.73	36.10	69.12	130.46	157.08
DMGNN ^[27]	13.14	24.62	64.68	81.86	23.30	50.32	107.30	132.10	12.47	25.77	48.08	58.29	15.27	29.27	71.54	96.65
Traj-GCN [33]	8.97	19.87	43.35	53.74	18.65	38.68	77.74	93.39	10.24	21.02	42.54	52.30	13.66	29.89	66.62	84.05
MSR-GCN	8.61	19.65	43.28	53.82	16.48	36.95	77.32	93.38	10.10	20.74	41.51	51.26	12.79	29.38	66.95	85.01

Short-term errors on CMU Mocap

scenarios	basketball				basketball signal					directi	ng traffic		jumping			
millisecond (ms)	80	160	320	400	80	160	320	400	80	160	320	400	80	160	320	400
Residual sup. [34]	15.45	26.88	43.51	49.23	20.17	32.98	42.75	44.65	20.52	40.58	75.38	90.36	26.85	48.07	93.50	108.90
DMGNN [27]	15.57	28.72	59.01	73.05	5.03	9.28	20.21	26.23	10.21	20.90	41.55	52.28	31.97	54.32	96.66	119.92
Traj-GCN [33]	11.68	21.26	40.99	50.78	3.33	6.25	13.58	17.98	6.92	13.69	30.30	39.97	17.18	32.37	60.12	72.55
MSR-GCN	10.28	18.94	37.68	47.03	3.03	5.68	12.35	16.26	5.92	12.09	28.36	38.04	14.99	28.66	55.86	69.05
scenarios	running				soccer					wa	lking		washwindow			
millisecond (ms)	80	160	320	400	80	160	320	400	80	160	320	400	80	160	320	400
Residual sup. [34]	25.76	48.91	88.19	100.80	17.75	31.30	52.55	61.40	44.35	76.66	126.83	151.43	22.84	44.71	86.78	104.68
DMGNN ^[27]	17.42	26.82	38.27	40.08	14.86	25.29	52.21	65.42	9.57	15.53	26.03	30.37	7.93	14.68	33.34	44.24
Traj-GCN [33]	14.53	24.20	37.44	41.10	13.33	24.00	43.77	53.20	6.62	10.74	17.40	20.35	5.96	11.62	24.77	31.63
MSR-GCN	12.84	20.42	30.58	34.42	10.92	19.50	37.05	46.38	6.31	10.30	17.64	21.12	5.49	11.07	25.05	32.51





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Quantitative Results



Average error on H3.6M