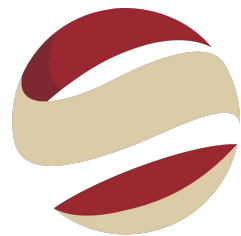


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Tracking Reconstruction

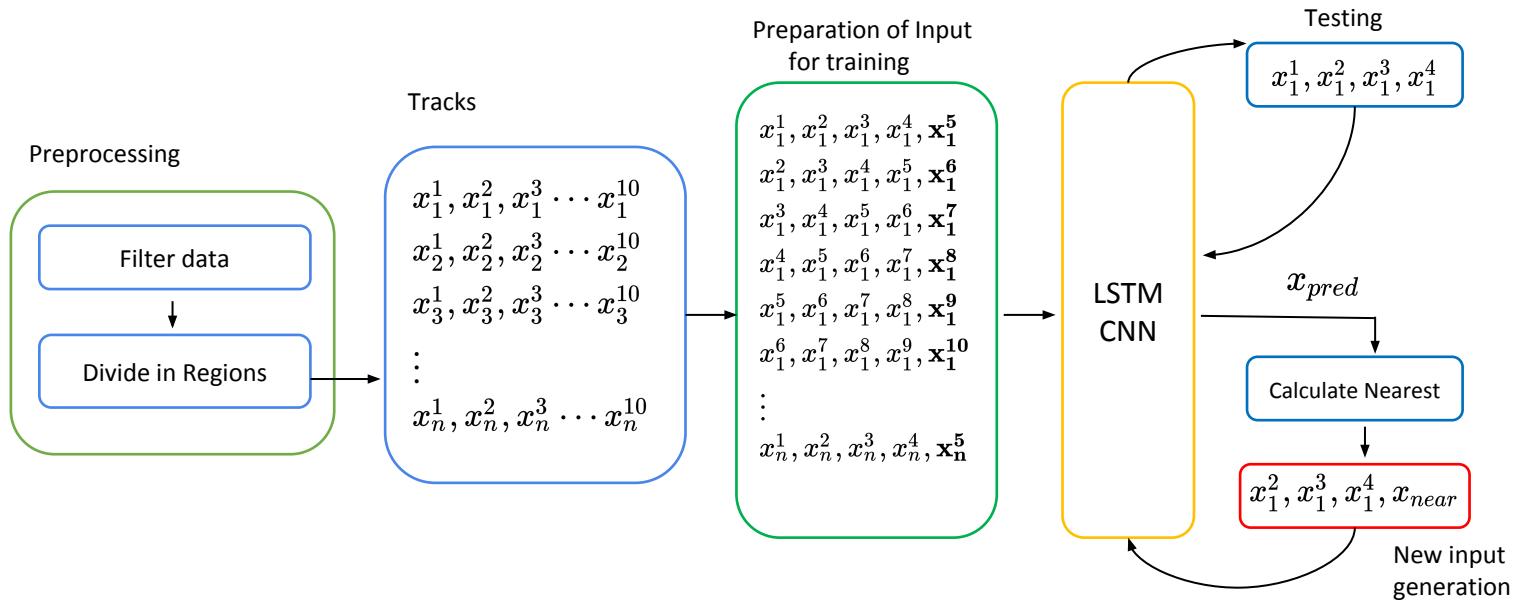
STEVE ATAUCURI

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Proposta



Avanços:

- ❑ Dois novos Modelos
 - CNN Parallel
 - LSTM Parallel
- ❑ Idea: separar (ρ , η , ϕ)

Input Anterior

$[x_1^1, y_1^1, z_1^1], [x_1^2, y_1^2, z_1^2], [x_1^3, y_1^3, z_1^3], [x_1^4, y_1^4, z_1^4],$
 $[x_1^2, y_1^2, z_1^2], [x_1^3, y_1^3, z_1^3], [x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5],$
 $[x_1^3, y_1^3, z_1^3], [x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6],$
 $[x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7],$
 $[x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7], [x_1^8, y_1^8, z_1^8],$
 $[x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7], [x_1^8, y_1^8, z_1^8], [x_1^9, y_1^9, z_1^9],$

$(\mathbf{x}_1^5, \mathbf{y}_1^5, \mathbf{z}_1^5)$
 $(\mathbf{x}_1^6, \mathbf{y}_1^6, \mathbf{z}_1^6)$
 $(\mathbf{x}_1^7, \mathbf{y}_1^7, \mathbf{z}_1^7)$
 $(\mathbf{x}_1^8, \mathbf{y}_1^8, \mathbf{z}_1^8)$
 $(\mathbf{x}_1^9, \mathbf{y}_1^9, \mathbf{z}_1^9)$
 $(\mathbf{x}_1^{10}, \mathbf{y}_1^{10}, \mathbf{z}_1^{10})$

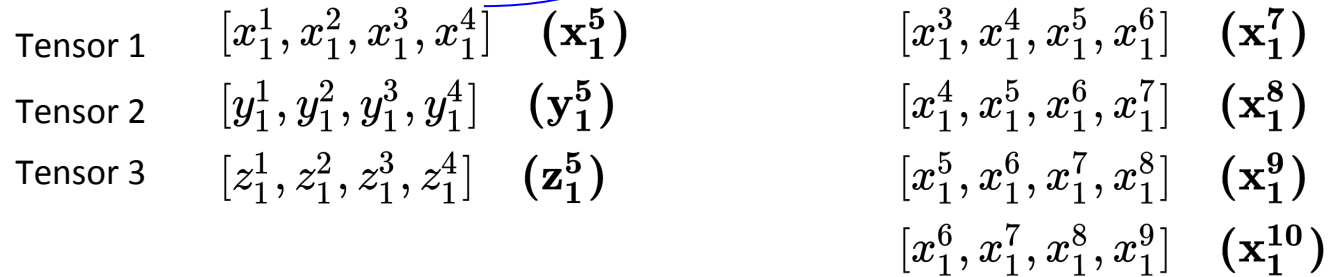
Input Paralelo

$(x_1^1, y_1^1, z_1^1), (x_1^2, y_1^2, z_1^2), (x_1^3, y_1^3, z_1^3), (x_1^4, y_1^4, z_1^4),$
 $[x_1^2, y_1^2, z_1^2], [x_1^3, y_1^3, z_1^3], [x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5],$
 $[x_1^3, y_1^3, z_1^3], [x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6],$
 $[x_1^4, y_1^4, z_1^4], [x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7],$
 $[x_1^5, y_1^5, z_1^5], [x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7], [x_1^8, y_1^8, z_1^8],$
 $[x_1^6, y_1^6, z_1^6], [x_1^7, y_1^7, z_1^7], [x_1^8, y_1^8, z_1^8], [x_1^9, y_1^9, z_1^9],$

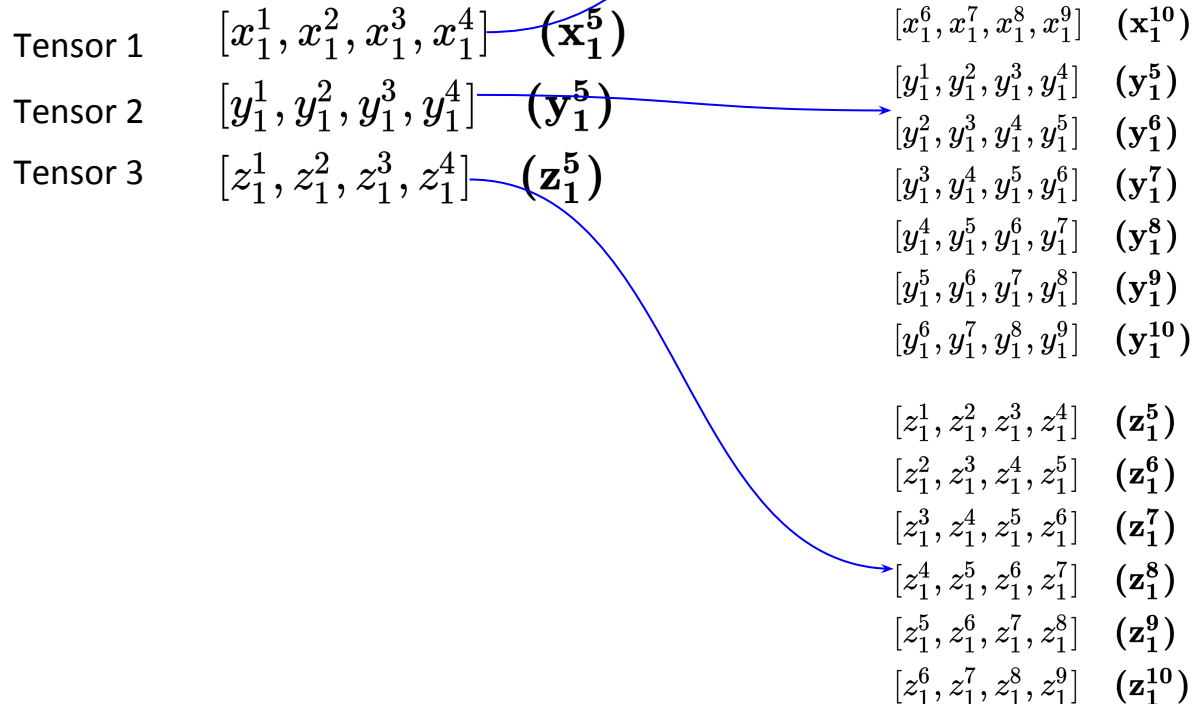
(x_1^5, y_1^5, z_1^5)
 (x_1^6, y_1^6, z_1^6)
 (x_1^7, y_1^7, z_1^7)
 (x_1^8, y_1^8, z_1^8)
 (x_1^9, y_1^9, z_1^9)
 $(x_1^{10}, y_1^{10}, z_1^{10})$

Tensor 1 $[x_1^1, x_1^2, x_1^3, x_1^4] \quad (\mathbf{x}_1^5)$
Tensor 2 $[y_1^1, y_1^2, y_1^3, y_1^4] \quad (\mathbf{y}_1^5)$
Tensor 3 $[z_1^1, z_1^2, z_1^3, z_1^4] \quad (\mathbf{z}_1^5)$

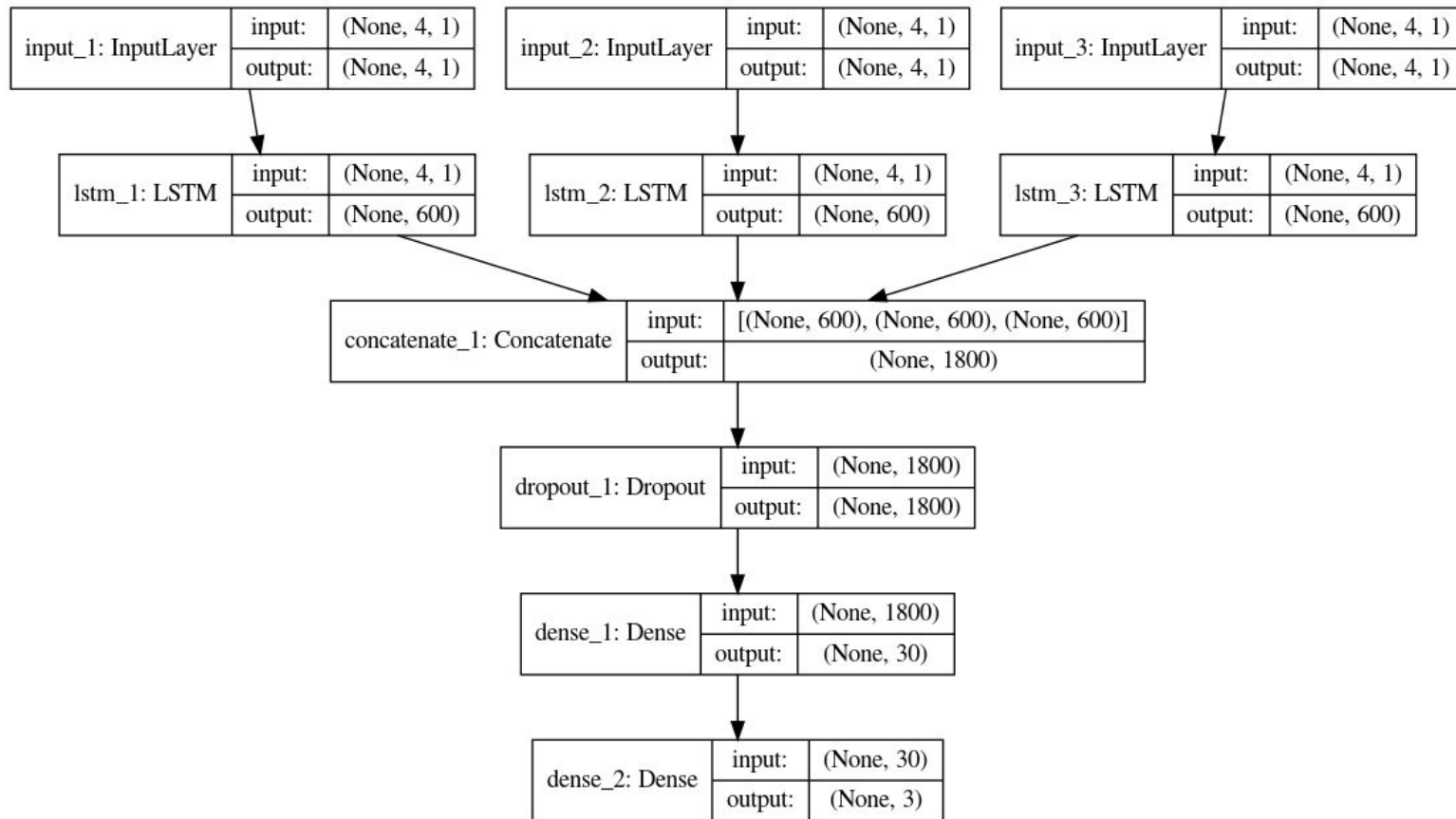
Input Paralelo



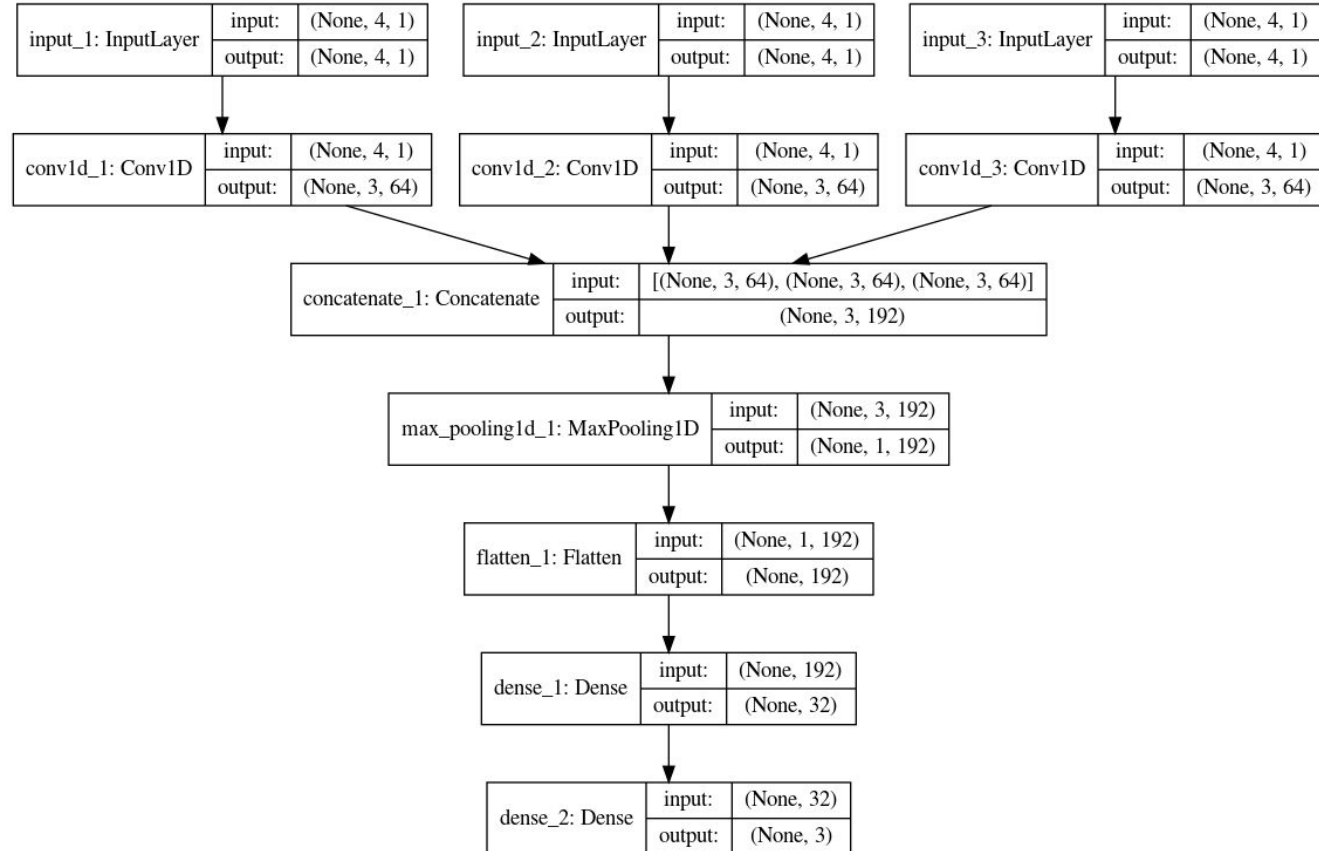
Input Paralelo



Arquitetura Paralela - LSTM



Arquitetura Paralela - CNN



Experimento

Subtitle

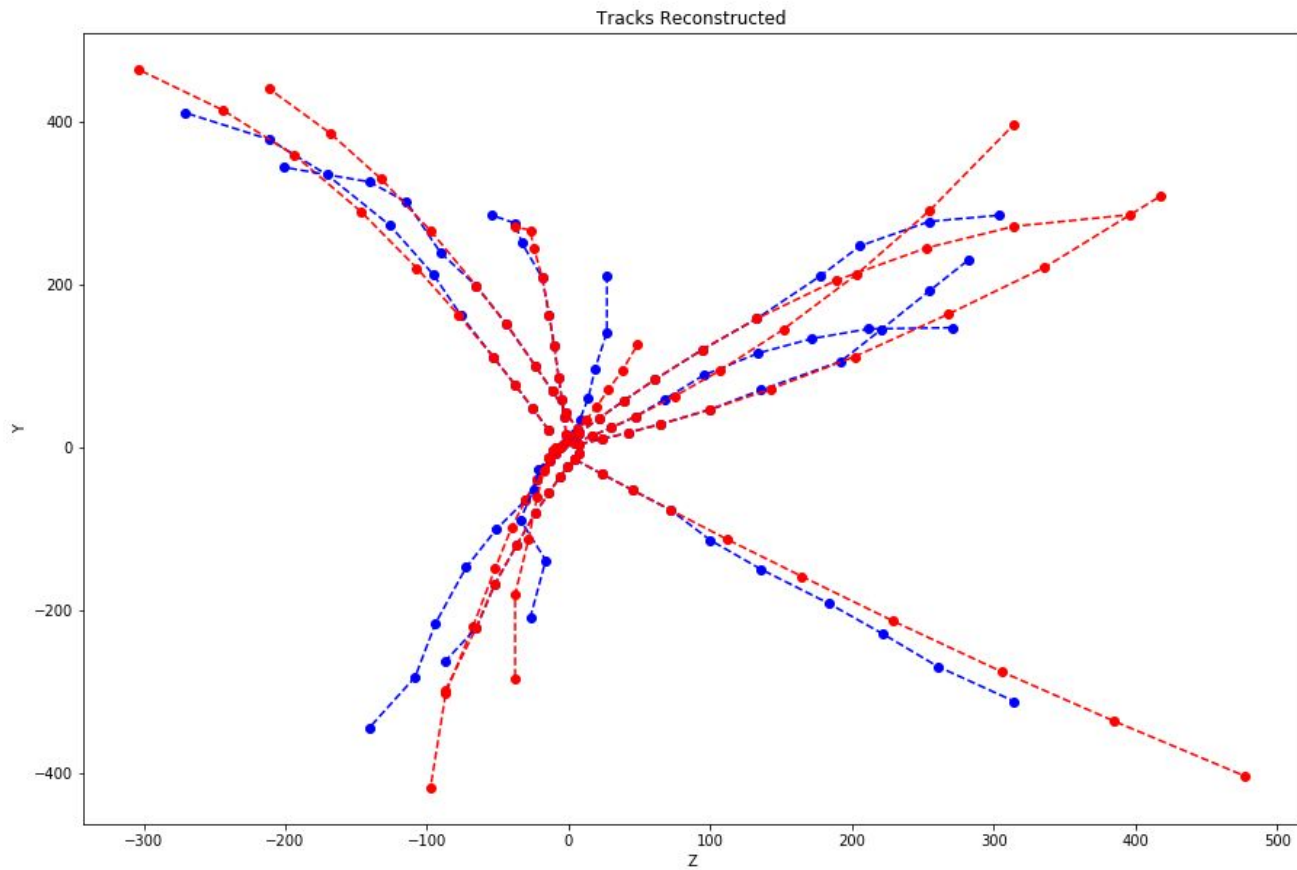
Resultados Previos

Resultados:

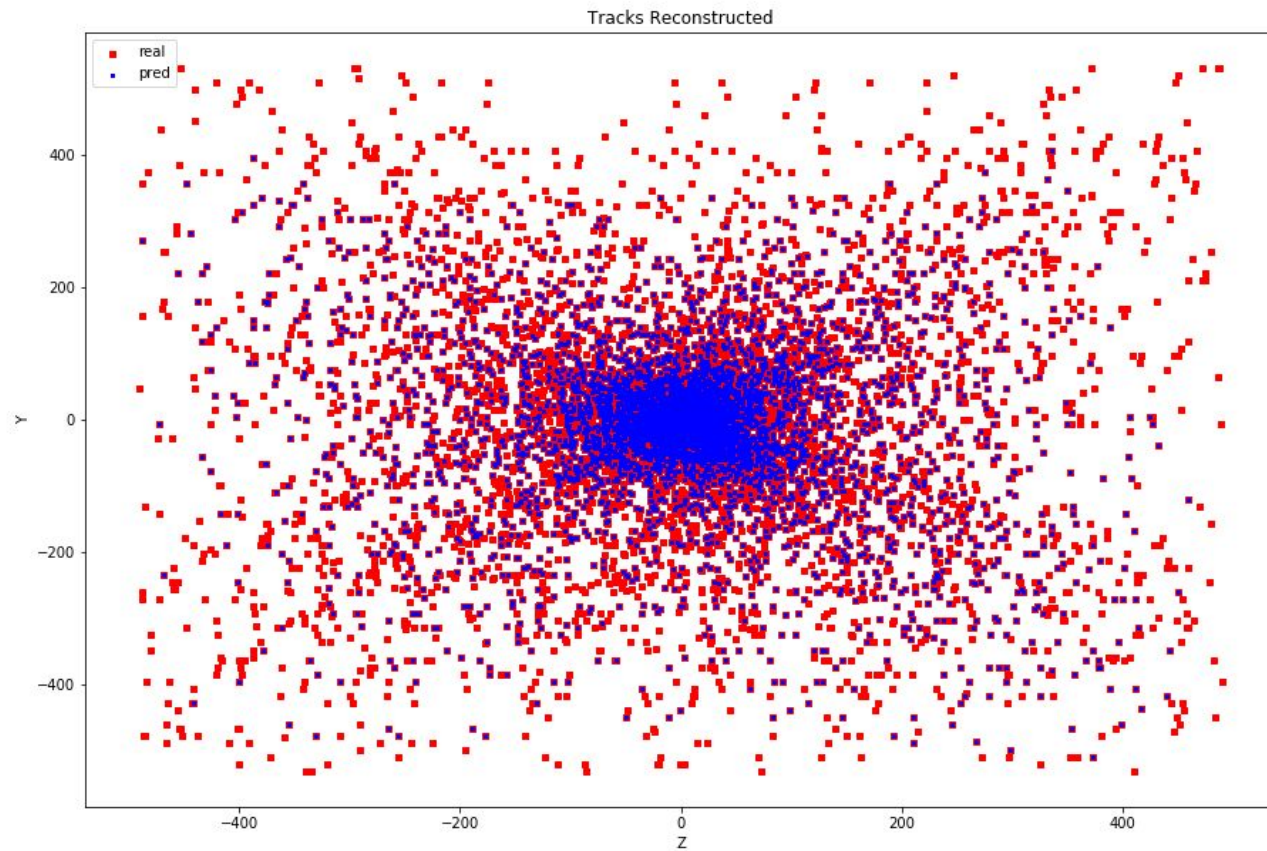
- ❑ Dataset:
 - eta_n0.5-0.5_phi_n0.5-0.5_short.csv
 - 5000 Tracks
 - 4000 treino, 1000 teste
 - Coordenadas XYZ
 - Região interna

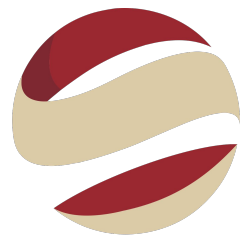
Nearest	L5	L6	L7	L8	L9	L10	Tracks
Hits	548	456	377	350	291	244	170/1000
Porcem.	54.8%	45.6%	37.7%	35%	29%	24.4%	170/1000
Normal							
Hits	0	0	0	0	0	0	0/1000
Normal	0%	0%	0%	0%	0%	0%	0/1000

C



Con





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Fin

Perguntas?

[Output] Results

---Parameters---

Model Name : lstm-parallel

Dataset : eta_n0.5-0.5_phi_n0.5-0.5_short.csv

Tracks : 1000

Model saved : /data/track-ml/eramia/compiled/model-lstm-parallel-HbDxsLfUkbjKW7BSN3yPXa-coord-xyz-normalise-true-epochs-18-batch-24.h5

Test date : 16/06/2020 16:16:09

Coordinates : xyz

Model Scaled : True

Model Optimizer : adam

Prediction Opt : nearest

Distance metric : euclidean

Correct hits per layer Nearest [548. 456. 377. 350. 291. 244.] of 1000 tracks tolerance=0.01:

Percentage correct hits : ['54.8%', '45.6%', '37.7%', '35.0%', '29.1%', '24.4%']

Correct hits per layer with Normal [0. 0. 0. 0. 0.] of 1000 tracks tolerance=0.01:

Percentage correct hits : ['0.0%', '0.0%', '0.0%', '0.0%', '0.0%', '0.0%']

Reconstructed tracks: 170 of 1000 tracks

---Regression Scores---

R_2 statistics (R2) = 0.987

Mean Square Error (MSE) = 1531.912

Root Mean Square Error(RMSE) = 39.14

Mean Absolute Error (MAE) = 14.427