

The effect of limb position on myoelectric prosthetic control using linear regression

Scientific Methods and Communication Conference 2017

December 14, 2017

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► Myoelectric prosthetics

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- ▶ Myoelectric prosthetics
- ▶ Variations in limb positions lower accuracy [1]

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[1] Fougner et al. IEEE TNSRE (2011)

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- ▶ Myoelectric prosthetics
- ▶ Variations in limb positions lower accuracy [1]
- ▶ Classification [1] vs regression [2]

[1] Fougner et al. IEEE TNSRE (2011)
[2] Hahne et al. IEEE TNSRE (2014)

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- ▶ Myoelectric prosthetics
- ▶ Variations in limb positions lower accuracy [1]
- ▶ Classification [1] vs regression [2]
- ▶ Test performance of linear regression- based control across different limb positions

[1] Fougner et al. IEEE TNSRE (2011)

[2] Hahne et al. IEEE TNSRE (2014)

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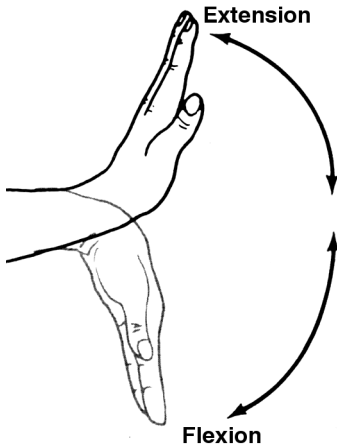
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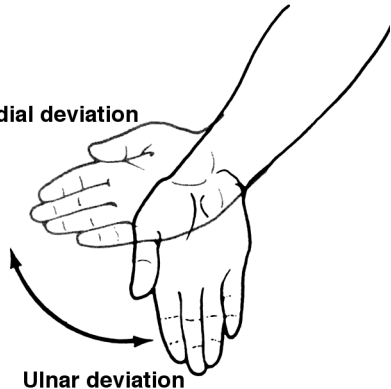
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Radial deviation



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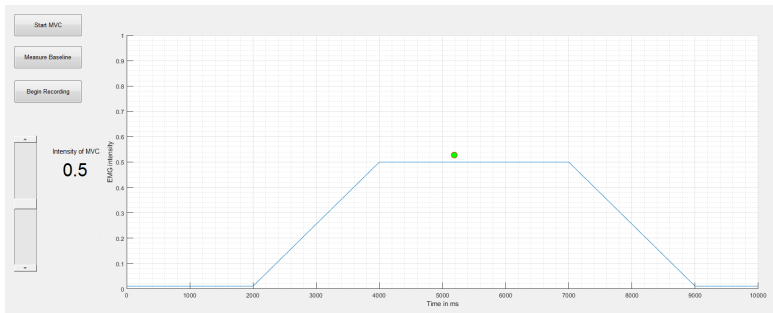
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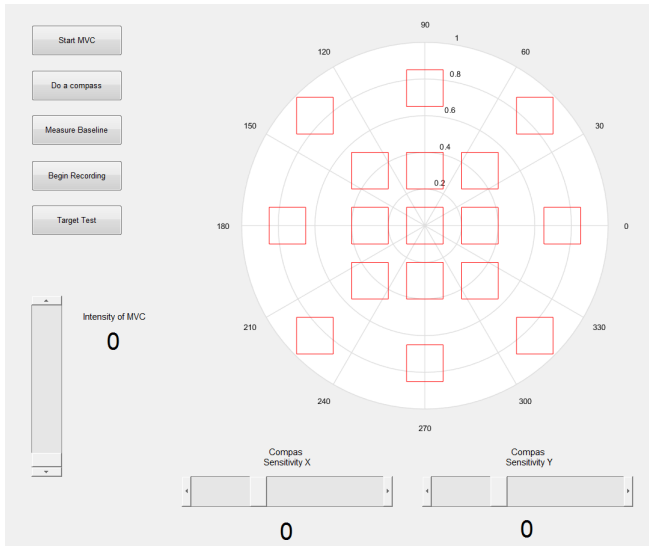
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Offline Results: training data

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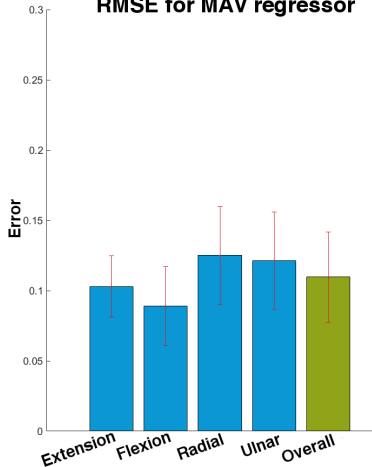
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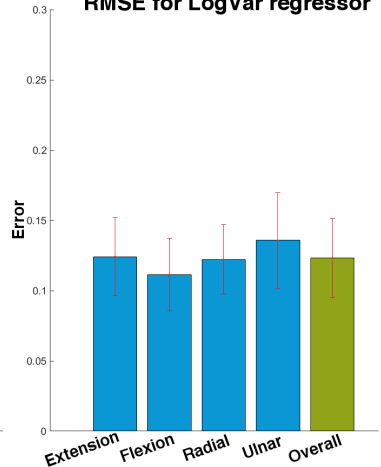
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RMSE for MAV regressor



RMSE for LogVar regressor



Significant difference between MAV and LogVar ($p = 0.0007$)

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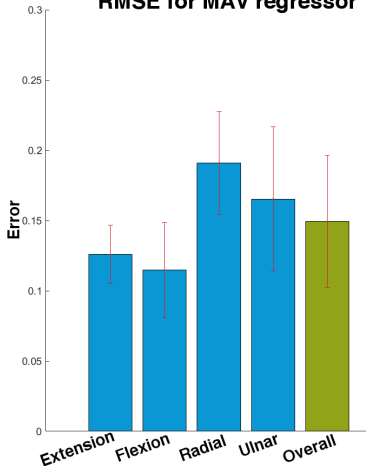
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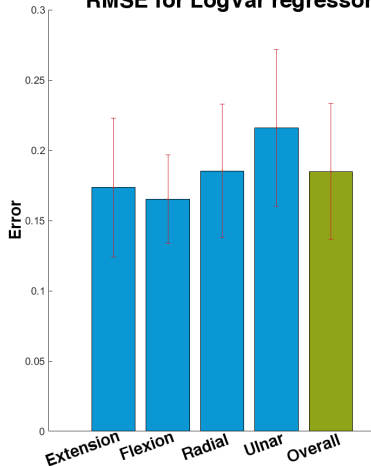
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RMSE for MAV regressor



RMSE for LogVar regressor



Significant difference between MAV and LogVar ($p = 0.00082$)

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Offline Results: training VS test

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- ▶ Significant difference between MAV training and MAV test data ($p = 0.0002$)
- ▶ Significant difference between LogVar training and LogVar test data ($p = 0.0002$)

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Online Results: MAV

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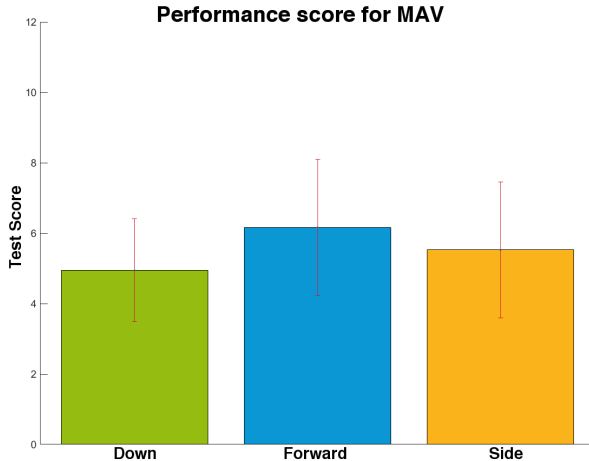
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No significant difference between limb positions ($p = 0.16$)

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Online Results: LogVar

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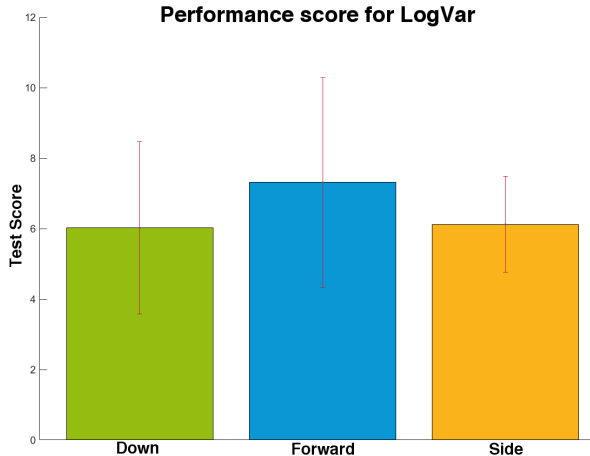
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No significant difference between limb positions ($p = 0.56$)

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- No significant difference between MAV and LogVar ($p = 0.13$)

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- ▶ Supervisors: Strahinja Dosen, Jakob Dideriksen and Lotte Struijk
- ▶ SMH for providing equipment
- ▶ Test subjects and Mikkel Birkedal

Thank you



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