

Patrick Marino, M.S.E.

Ph.D. Candidate

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Education

University of Pittsburgh, Pittsburgh, PA (2018 - present)

Ph.D. candidate, Department of Bioengineering, Co-advisors: Aaron Batista, Byron Yu, and Steve Chase

Proposed Thesis: "The influence of posture and reward signals on motor cortical population activity"

University of Texas at Austin, Austin, TX (2015 - 2018)

M.S.E., Department of Mechanical Engineering, Advisor: Ashish Deshpande

Thesis: "Towards a robust reach onset decoder for electrocorticography-based BCI's"

University of Notre Dame, Notre Dame, IN (2010 - 2015)

B.S., Physics, B.S., Mechanical Engineering, Cum Laude

Positions Held

Ph.D. Candidate, SMILE Laboratory, University of Pittsburgh (2018 - present)

Co-advisors: Aaron Batista, Byron Yu, Steve Chase

Proposed Thesis: "The influence of posture and reward signals on motor cortical population activity"

Additional research areas: brain-computer interfaces, sensorimotor integration, reward processing in motor cortex, neural population dynamics

Graduate Student Researcher, University of Texas at Austin (2015 - 2018)

Advisor: Ashish Deshpande

Thesis: "Towards a robust reach onset decoder for electrocorticography-based BCI's"

REU Summer Research Assistant, Georgia Institute of Technology, (2014)

Designed, modeled, fabricated, and controlled a low-cost, wheelchair-mounted robotic arm to assist paralyzed patients

Awards and Honors

Neural Control of Movement Scholarship (2022)

McClelland Prize, Center for the Neural Basis of Cognition, University of Pittsburgh and Carnegie Mellon University (2022)

Bioengineering Travel Grant, University of Pittsburgh (2022)

Bevier Award, University of Pittsburgh (2018)

National Science Foundation Graduate Research Fellowship Program (2015 - 2018)

Tau Beta Pi Honor society, University of Notre Dame (2013 - 2015)

President's Scholarship, University of Notre Dame (2010-2015)

Dean's List, University of Notre Dame (2010 - 2015)

Publications

(* = equal contribution; ** = equal senior author contribution)

Smoulder, A.L.*, Pavlovsky, N.P.*, **Marino, P.J.***, Degenhart, A.D., McClain, N.T., Batista, A.P.**, Chase, S.M.** (2021) Monkeys exhibit a paradoxical decrease in performance in high-stakes scenarios. Proceedings of the National Academy of Sciences, 118 (35) e2109643118.

Publications in Preparation

Marino, P.J., Bahureksa, L.A., Fisac, C., Oby, E.R., Motiwala, A., Grigsby, E.M., Smoulder, A.L., Degenhart, A.D., Joiner, W.M., Chase, S.M., Yu, B.M., Batista, A.P. (2022) Posture and volitional signals modulate separate neural dimensions.

Smoulder, A.L., **Marino, P.J.**, Pavlovsky, N.P., Oby, E.R., Snyder, S.E., Bishop, W.E., Yu, B.M., Chase, S.M.**, Batista, A.P.** (2022) Exceptionally large rewards collapse task information in neural population activity.

Degenhart, A.D.*, Grigsby, E.M.*, Oby, E.R.*, Motiwala, A., McClain, N.T., **Marino, P.J.**, Batista, A.P.**, Yu, B.M.**. (2022) Constraints on the temporal sequencing of neural population activity.

Talks

Marino, P. (2022). Postural and volitional signals modulate separate neural dimensions. Oral Presentation at Neural Control of Movement Annual Meeting.

Marino, P. (2022). Monkeys exhibit a paradoxical performance decrement in high-stakes scenarios. Oral Presentation at Center for the Neural Basis of Cognition Annual Retreat.

Conference Presentations

(* = equal contribution; ** = equal senior author contribution)

Marino, P.J., Bahureksa, L.A., Fisac, C., Oby, E.R., Motiwala, A., Grigsby, E.M., Smoulder, A.L., Degenhart, A.D., Joiner, W.M., Chase, S.M., Yu, B.M., Batista A.P. (2022). Posture and motor signals are organized in primary motor cortex. Poster presentation at the Society for Neuroscience Annual Meeting.

Marino, P.J., Bahureksa, L.A., Fisac, C., Oby, E.R., Motiwala, A., Grigsby, E.M., Smoulder, A.L., Degenhart, A.D., Joiner, W.M., Chase, S.M., Yu, B.M., Batista A.P. (2022). Postural and volitional signals modulate separate neural dimensions. Invited Talk at the Neural Control of Movement Annual Meeting.

Smoulder, A.L., **Marino, P.J.**, Pavlovsky, N.P., Oby, E.R., Snyder, S.E., Bishop, W.E., Yu, B.M., Chase, S.M.** , Batista, A.P.** (2022). Exceptionally large rewards collapse task information in neural population activity. Poster presentation at the Society for Neuroscience Annual Meeting.

Degenhart*, A.D., Grigsby, E.M.* , Oby, E.R.* , Motiwala, A., McClain, N.T., **Marino, P.J.**, Batista, A.P.** , Yu, B.M.** (2022). Constraints on the temporal sequencing of neural population activity. Poster presentation at the Society for Neuroscience Annual Meeting.

Smoulder, A.L., **Marino, P.J.**, Pavlovsky, N.P., Oby, E.R., Snyder, S.E., Bishop, W.E., Yu, B.M., Chase, S.M.** , Batista, A.P.** (2022). Exceptionally large rewards lead to a collapse in neural information about upcoming movements. Poster presentation at Computational and Systems Neuroscience (Cosyne) Meeting.

Marino, P.J., Oby, E.R., Motiwala, A., Grigsby, E.M., Degenhart, A.D., Yu, B.M., Batista, A.P. (2021) The arm's posture does not alter the time course of population activity in motor cortex. Poster presentation at Computational and Systems Neuroscience (Cosyne) Meeting.

Degenhart, A.D., Grigsby, E.M., McClain, N.T., **Marino, P.J.**, Motiwala, A., Oby, E.R., Batista, A.P., Yu, B.M. (2020) Constraints on the time course of neural population activity. Poster presentation at Computational and Systems Neuroscience (Cosyne) Meeting.

Pavlovsky, N.P., Degenhart, A.D., **Marino, P.J.**, McClain, N.T., Smoulder, A.L., Batista, A.P., Chase, S.M. (2019) Monkeys Choke Under Pressure. Poster presentation at Society for Neuroscience Annual Meeting.

Teaching

Teaching Assistant, Senior Design, University of Texas at Austin (2016 - 2017)

Teaching Assistant, Introduction to Fortran, University of Notre Dame (2014)

Professional Service

Engineering Graduate Student Organization Social Chair, University of Pittsburgh (2015)

Co-founder, Neural Interface Initiative, University of Texas at Austin (2016 - 2018)

President, Tau Beta Pi, University of Notre Dame (2014)

Engineering Commissioner for Alumni Hall, University of Notre Dame (2012)