

Matthew T. Clark PhD

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Curriculum Vita

Education

PhD, Mechanical Engineering Virginia Tech, Nov 2008 (**Top 25 graduate engineering**)
MS, Mechanical Engineering Virginia Tech, July 2006 (**Top 25 graduate engineering**)
BS, Mechanical Engineering Rose-Hulman, May 2004 (**#1 undergraduate engineering**)

Experience

Advanced Medical Predictive Devices, Diagnostics, and Displays Inc. 2014-
--Chief Science Officer

Medical Predictive Sciences Corp. -- Senior Programmer 2013

University of Virginia -- Research Scientist 2012
Department of Medicine
Focus: Continuous physiological monitoring of all monitored and telimetered patients in the UVA health system.

University of Virginia -- Research Associate 2010-2012
Department of Chemical Engineering
Focus: Continuous monitoring of cardiorespiratory interaction for early identification of critical illness in neonatal intensive care patients.
Collaboration: UVA Cardiology, UVA Neonatology, William and Mary Physics.

Virginia Tech -- Research Associate 2009
Department of Mechanical Engineering
Focus: Theoretical and numerical modeling of the stochastic and driven dynamics of micron scale fluid-structure interaction for single molecule biophysics.
Collaboration: VT Chemical Engineering, U. Melbourne Mathematics.

Journal Publications

CM Ruminski, **MT Clark**, DE Lake, RR Kitzmiller, JL Keim-Malpass, MP Robertson, TR Simons, JR Moorman, JF Calland. Impact of predictive analytics based on continuous cardiorespiratory monitoring in a Surgical and Trauma Intensive Care Unit. *J Clin Monit Comput*, In Press.

Keim-Malpass J, Enfield KB, Calland JF, Lake DE, **Clark MT**. Dynamic data monitoring improves predictive analytics for failed extubation in the ICU. *Physiol Meas*, 39(7), 2018 pp 075005.

Keim-Malpass J, Kitzmiller RR, Skeeles-Worley A, Lindberg C, **Clark MT**, Tai R, Calland JF, Sullivan K, Randall Moorman J, Anderson RA. Advancing Continuous Predictive Analytics Monitoring: Moving from Implementation to Clinical Action in a Learning Health System. *Crit Care Nurs Clin North Am*, 30(2), 2018 pp 273-287.

Blackburn HN, **Clark MT**, Moorman JR, Lake DE, Calland JF. Identifying the low risk patient in surgical intensive and intermediate care units using continuous monitoring. *Surgery*, 163(4), 2018 pp 811-818.

Moss TJ, **Clark MT**, Calland JF, Enfield KB, Voss JD, Lake DE, Moorman JR. Cardiorespiratory dynamics measured from continuous ECG monitoring improves detection of deterioration in acute care patients: A retrospective cohort study. *PLoS One*, 12(8), 2017 pp e0181448.

HN Blackburn, **MT Clark**, TJ Moss, JS Young, JR Moorman, DE Lake, JF Calland. External validation in an intermediate unit of a respiratory decompensation model trained in an intensive care unit. *Surgery*, 161(3), 2017 pp 760-770.

MT Clark, JB Delos, DE Lake, H Lee, KD Fairchild, J Kattwinkel, JR Moorman. Stochastic modeling of central apnea events in preterm infants. *Physiol. Meas.*, 37, 2016 pp 463.

TJ Moss, **MT Clark**, DE Lake, JR Moorman, JF Calland. Heart rate dynamics preceding hemorrhage in the intensive care unit. *J. Electrocardiol.*, 48(6), 2015 pp 1075-80.

MA Mohr, KD Fairchild, M Patel, RA Sinkin, **MT Clark**, JR Moorman, DE Lake, J Kattwinkel, JB Delos. Quantification of periodic breathing in premature infants. *Physiol. Meas.*, 36, 2015 pp 1415-1427.

Mohr MA, Vergales BD, Lee H, **Clark MT**, Lake DE, Mennen AC, Kattwinkel J, Sinkin RA, Moorman JR, Fairchild KD, Delos JB. Very long apnea events in preterm infants. *J Appl Physiol*, 118(5), 2015.

BD Vergales, AO Paget-Brown, H Lee, LE Guin, TJ Smoot, CG Rusin, **MT Clark**, JB Delos, KD Fairchild, DE Lake, R Moorman, J Kattwinkel. Accurate Automated Apnea Analysis in Preterm Infants. *Am. J. Perinatol*, 31(2), 2014.

MR Paul, **MT Clark**, MC Cross. Coupled motion of microscale and nanoscale elastic objects in a viscous fluid. *Phys. Rev. E* 88, 2013 pp 043012.

AD Politano, LM Riccio, DE Lake, CG Rusin, LE Guin, CS Josef, **MT Clark**, RG Sawyer, JR Moorman, JF Calland. Predicting the Need for Urgent Intubation in a Surgical/Trauma Intensive Care Unit. *Surgery*, 154(5), 2013.

MT Clark, BD Vergales, AO Paget-Brown, TJ Smoot, DE Lake, JL Hudson, JB Delos, J Kattwinkel, JR Moorman. Predictive monitoring for respiratory decompensation leading to urgent

unplanned intubation in the Neonatal Intensive Care Unit. *Pediatr. Res.*, 73(1), 2012 pp 104–110

K Zagol, DE Lake, B Vergales, ME Moorman, AO Paget-Brown, H Lee, CG Rusin, JB Delos, **MT Clark**, JR Moorman, J Kattwinkel. The role of anemia in apnea of prematurity and the effect of blood transfusion. *J. Pediatr.*, 161(3), 2012 pp 417-421

MT Clark, CG Rusin, JL Hudson, H Lee, JB Delos, LE Guin, BD Vergales, AO Paget-Brown, J Kattwinkel, DE Lake, JR Moorman. Breath-by-breath analysis of cardiorespiratory interaction for quantifying developmental maturity in premature infants. *J. Appl. Physiol.* 112(5), 2012 pp. 859-867

H Lee, CG Rusin, DE Lake, **MT Clark**, LE Guin, TJ Smoot, AO Paget-Brown, BD Vergales, J Kattwinkel, JR Moorman, and JB Delos. A new algorithm for detecting central apnea in neonates. *Physiol. Meas.* 33(1), 2012 pp. 1–17

KA Blaha, A Pikovsky, M Rosenblum, **MT Clark**, CG Rusin, JL Hudson. Reconstruction of two-dimensional phase dynamics from experiments on coupled oscillators. *Phys. Rev. E* 84(4), 2011 pp. 046201

Conference Proceedings

10th International Conference on Complexity in Acute Illness *Sept. 2011*
MT Clark, CG Rusin, JL Hudson, H Lee, JB Delos, LE Guin, TJ Smoot, BD Vergales, AO Paget-Brown, J Kattwinkel, DE Lake, JR Moorman. *Acute uncoupling of heartbeat and respiration in neonatal respiratory decompensation.*

33rd Annual International IEEE EMBS Conference *Sept. 2011*
Invited Session Paper
JR Moorman, CG Rusin, H Lee, LE Guin, MT Clark, JB Delos, J Kattwinkel, DE Lake. *Predictive Monitoring for Early Detection of Subacute Potentially Catastrophic Illnesses in Critical Care.* Boston, MA

Pediatric Academic Societies Annual Meeting *May 2010*
B Vergales, MD, A Paget-Brown, MD, S Callahan, L Guin, R Kelly, RN, M Clark, PhD, C Rusin, PhD, D Lake, PhD, R Moorman, MD, J Kattwinkel, MD. *Apnea of Prematurity A Comparison of Nursing Records with Continuous Electronic Waveform Analysis.* Vancouver, Canada