

DUKE UNIVERSITY MEDICAL CENTER

CURRICULUM VITAE

**for
Permanent Record and the
Appointments and Promotions Committee**

Date Prepared: 7/1/2021

Xiao Hu, PhD

Primary academic appointment: Ann Henshaw Gardiner Distinguished Professor

Primary academic department: School of Nursing

Secondary appointment:

Professor, Department of Neurology, School of Medicine

Professor, Department of Biostatistics and bioinformatics, School of Medicine

Associate Professor, Department of Surgery, School of Medicine

Professor, Department of Biomedical Engineering, Pratt School of Engineering

Professor, Department of Electrical and Computer Engineering, Pratt School of Engineering

Present academic rank and title: Professor (tenured)

Date and rank of first Duke Faculty appointment: January 1, 2020

Date of birth: February 2, 1974

Place: Chongqing, Chongqing, China

Citizen of: the USA

Education:

<u>Education</u>	<u>Institution</u>	<u>Dates (Year)</u>	<u>Degree(s)</u>	<u>Major/Minor</u>
College(s)	University of Electronic Science and Technology, Chengdu, China	1992-1992	BS	Biomedical Engineering
	University of Electronic Science and Technology, Chengdu, China	1996-1999	MS	Biomedical Engineering
	University of California, Los Angeles, California	1999-2004	PhD	Biomedical Engineering

Scholarly societies (*e.g. Sigma Theta Tau, Phi Beta Kappa, Sigma Xi, etc*):

<u>Society</u>	<u>Date (Year)</u>
Member, IEEE Engineering in Medicine and Biology Society.	2004 - 2012
Member, Institute of Electrical and Electronics Engineers (IEEE)	2004 - 2012
Senior Member, Institute of Electrical and Electronics Engineers (IEEE)	2012 -
Senior Member, IEEE Engineering in Medicine and Biology Society.	2012 -
Member, Society of Critical Care Medicine	2013 -

Professional and academic career:

<u>Institution</u>	<u>Position/Title</u>	<u>Dates (Year)</u>
University of California, Los Angeles	Biomedical Engineering Graduate Program / Graduate Student Researcher	1999 - 2004
University of California, Los Angeles	Professional Assistant Researcher	2004 - 2006
Global Care Quest Inc., Irvine, CA	Scientific Software Consultant	2005 - 2011
University of California, Los Angeles	Assistant Professor in-residence	2006 - 2010
University of California, Los Angeles	Affiliated faculty	2007 - 2013
University of California, Los Angeles	Associate Professor in-residence	2010 - 2013
University of California, San Francisco	Associate Professor	2013 - 2018
University of California, San Francisco	Associate Professor (joint non-salaried) of Neurological Surgery	2013 - 2018
University of California, San Francisco	Affiliate Faculty of UCB-UCSF Joint Bioengineering Program	2013 -
University of California, San Francisco	Affiliate Member of Bakar Institute of Computational Health Sciences	2013 - 2017
International Advisory Board Member	Physiological Measurement	2014 - 2015
Editorial Board Member	Journal of Medical Engineering	2014

<u>Institution</u>	<u>Position/Title</u>	<u>Dates (Year)</u>
Editorial Board Member	Physiological Measurement	2015 -
University of California, San Francisco	Core Member of UCB-UCSF Joint Bioengineering Program	2017 -
NIH Biomedical Computing and Health Informatics Study Section [BCHI]	Standing Member	2017 - 2021
University of California, San Francisco	Full Professor of Physiological Nursing	2018 -
University of California, San Francisco	Full Professor (joint non-salaried) of Neurological Surgery)	2018 -
PLOS ONE	Academic editor	2018 -
Physiological Measurement	Editor-in-Chief	2020 -
Duke School of Nursing	Professor	2020 -
Duke School of Nursing	Ann Crenshaw Gardiner Distinguished Professor of Nursing	7/1/2020
Duke Department of Electrical & Computer Engineering	Professor – 2 nd appointment	2020-
Duke Department of Biostatistics & Bioinformatics	Professor – 2 nd appointment	2020-
Duke Department of Neurology	Professor – 2 nd appointment	2020-
Duke Department of Biomedical Engineering	Professor – 2 nd appointment	2020-
Duke Department of Surgery	Associate professor – 2 nd appointment	2020-

Publications:

1. Refereed journals:

Published

1. Hu X, Nenov V. Robust measure for characterizing generalized synchronization. Phys Rev E Stat Nonlin Soft Matter Phys. 2004 Feb; 69(2 Pt 2):026206. PMID: 14995547
2. Hu X, Nenov V. Multivariate AR modeling of electromyography for the classification of upper arm movements. Clin Neurophysiol. 2004 Jun; 115(6):1276-87. PMID: 15134694

3. Bergsneider M, Yang I, Hu X, McArthur DL, Cook SW, Boscardin WJ. Relationship between valve opening pressure, body position, and intracranial pressure in normal pressure hydrocephalus: paradigm for selection of programmable valve pressure setting. *Neurosurgery*. 2004 Oct; 55(4):851-8; discussion 858-9. PMID: 15458593
4. Hu X, Nenov V, Vespa P, Bergsneider M. Estimation of hidden state variables of the intracranial system using constrained nonlinear Kalman filters. *Conf Proc IEEE Eng Med Biol Soc*. 2005; 6:5631-4. PMID: 17281533
5. Hu X, Nenov V, Bergsneider M. Phase Coordination between Intracranial Pressure and Electrocardiogram Signals. *Conf Proc IEEE Eng Med Biol Soc*. 2005; 1:45-8. PMID: 17282107
6. Hu X, Alwan AA, Rubinstein EH, Bergsneider M. Reduction of compartment compliance increases venous flow pulsatility and lowers apparent vascular compliance: implications for cerebral blood flow hemodynamics. *Med Eng Phys*. 2006 May; 28(4):304-14. PMID: 16112597
7. Hu X, Nenov V, Bergsneider M. Integrative analysis of intracranial pressure and R-R interval signals: a study of ICP B-wave using causal coherence. *Conf Proc IEEE Eng Med Biol Soc*. 2006; 1:464-7. PMID: 17945587
8. Hu X, Nenov V. A single-lead ECG enhancement algorithm using a regularized data-driven filter. *IEEE Trans Biomed Eng*. 2006 Feb; 53(2):347-51. PMID: 16485766
9. Hu X, Nenov V, Glenn TC, Steiner LA, Czosnyka M, Bergsneider M, Martin N. Nonlinear analysis of cerebral hemodynamic and intracranial pressure signals for characterization of autoregulation. *IEEE Trans Biomed Eng*. 2006 Feb; 53(2):195-209. PMID: 16485748
10. Vespa PM, Miller C, Hu X, Nenov V, Buxey F, Martin NA. Intensive care unit robotic telepresence facilitates rapid physician response to unstable patients and decreased cost in neurointensive care. *Surg Neurol*. 2007 Apr; 67(4):331-7. PMID: 17350395
11. Hu X, Nenov V, Bergsneider M, Glenn TC, Vespa P, Martin N. Estimation of hidden state variables of the Intracranial system using constrained nonlinear Kalman filters. *IEEE Trans Biomed Eng*. 2007 Apr; 54(4):597-610. PMID: 17405367
12. Hu X, Nenov V, Vespa P, Bergsneider M. Characterization of interdependency between intracranial pressure and heart variability signals: a causal spectral measure and a generalized synchronization measure. *IEEE Trans Biomed Eng*. 2007 Aug; 54(8):1407-17. PMID: 17694861
13. Hu X, Miller C, Vespa P, Bergsneider M. Adaptive computation of approximate entropy and its application in integrative analysis of irregularity of heart rate variability and intracranial pressure signals. *Med Eng Phys*. 2008 Jun; 30(5):631-9. PMID: 17714974

14. Cattivelli FS, Sayed AH, Hu X, Lee D, Vespa P. Mathematical models of cerebral hemodynamics for detection of vasospasm in major cerebral arteries. *Acta Neurochir Suppl.* 2008; 102:63-9. PMID: 19388290
15. Hu X, Xu P, Lee DJ, Paul V, Bergsneider M. Morphological changes of intracranial pressure pulses are correlated with acute dilatation of ventricles. *Acta Neurochir Suppl.* 2008; 102:131-6. PMID: 19388304
16. Xu P, Scalzo F, Bergsneider M, Vespa P, Chad M, Hu X. Wavelet entropy characterization of elevated intracranial pressure. *Conf Proc IEEE Eng Med Biol Soc.* 2008; 2008:2924-7. PMID: 19163318
17. Scalzo F, Xu P, Bergsneider M, Hu X. Nonlinear regression for sub-peak detection of intracranial pressure signals. *Conf Proc IEEE Eng Med Biol Soc.* 2008; 2008:5411-4. PMID: 19163941
18. Bergsneider M, Miller C, Vespa PM, Hu X. Surgical management of adult hydrocephalus. *Neurosurgery.* 2008 Feb; 62 Suppl 2:643-59; discussion 659-60. PMID: 18596440
19. Hu X, Xu P, Lee DJ, Vespa P, Baldwin K, Bergsneider M. An algorithm for extracting intracranial pressure latency relative to electrocardiogram R wave. *Physiol Meas.* 2008 Apr; 29(4):459-71. PMID: 18354246
20. Xu P, Bergsneider M, Hu X. Pulse onset detection using neighbor pulse-based signal enhancement. *Med Eng Phys.* 2009 Apr; 31(3):337-45. PMID: 18632299
21. Xu P, Tian Y, Lei X, Hu X, Yao D. Equivalent charge source model based iterative maximum neighbor weight for sparse EEG source localization. *Ann Biomed Eng.* 2008 Dec; 36(12):2051-67. PMID: 18830695
22. Hu X, Xu P, Scalzo F, Vespa P, Bergsneider M. Morphological clustering and analysis of continuous intracranial pressure. *IEEE Trans Biomed Eng.* 2009 Mar; 56(3):696-705. PMID: 19272879
23. Hamilton R, Xu P, Asgari S, Kaspruwicz M, Vespa P, Bergsneider M, Hu X. Forecasting intracranial pressure elevation using pulse waveform morphology. *Conf Proc IEEE Eng Med Biol Soc.* 2009; 2009:4331-4. PMID: 19963821
24. Hu X, Subudhi AW, Xu P, Asgari S, Roach RC, Bergsneider M. Inferring cerebrovascular changes from latencies of systemic and intracranial pulses: a model-based latency subtraction algorithm. *J Cereb Blood Flow Metab.* 2009 Apr; 29(4):688-97. PMID: 19142194
25. Scalzo F, Xu P, Asgari S, Bergsneider M, Hu X. Regression analysis for peak designation in pulsatile pressure signals. *Med Biol Eng Comput.* 2009 Sep; 47(9):967-77. PMID: 19578916
26. Sapo M, Wu S, Asgari S, McNair N, Buxey F, Martin N, Hu X. A comparison of vital signs charted by nurses with automated acquired values using waveform quality indices. *J Clin Monit Comput.* 2009 Oct; 23(5):263-71. PMID: 19629728

27. Xu P, Kasprowicz M, Bergsneider M, Hu X. Improved noninvasive intracranial pressure assessment with nonlinear kernel regression. *IEEE Trans Inf Technol Biomed.* 2010 Jul; 14(4):971-8. PMID: 19643711
28. Asgari S, Xu P, Bergsneider M, Hu X. A subspace decomposition approach toward recognizing valid pulsatile signals. *Physiol Meas.* 2009 Nov; 30(11):1211-25. PMID: 19794232
29. Asgari S, Bergsneider M, Hu X. A robust approach toward recognizing valid arterial-blood-pressure pulses. *IEEE Trans Inf Technol Biomed.* 2010 Jan; 14(1):166-72. PMID: 19884099
30. Hu X, Xu P, Wu S, Asgari S, Bergsneider M. A data mining framework for time series estimation. *J Biomed Inform.* 2010 Apr; 43(2):190-9. PMID: 19900575
31. Hu X, Glenn T, Scalzo F, Bergsneider M, Sarkiss C, Martin N, Vespa P. Intracranial pressure pulse morphological features improved detection of decreased cerebral blood flow. *Physiol Meas.* 2010 May; 31(5):679-95. PMID: 20348611
32. Hu X, Xu P, Asgari S, Vespa P, Bergsneider M. Forecasting ICP elevation based on prescient changes of intracranial pressure waveform morphology. *IEEE Trans Biomed Eng.* 2010 May; 57(5):1070-8. PMID: 20659820
33. Kasprowicz M, Asgari S, Bergsneider M, Czosnyka M, Hamilton R, Hu X. Pattern recognition of overnight intracranial pressure slow waves using morphological features of intracranial pressure pulse. *J Neurosci Methods.* 2010 Jul 15; 190(2):310-8. PMID: 20566403
34. Scalzo F, Asgari S, Kim S, Bergsneider M, Hu X. Robust peak recognition in intracranial pressure signals. *Biomed Eng Online.* 2010; 9:61. PMID: 20959014
35. Kim S, Scalzo F, Bergsneider M, Vespa P, Martin N, Hu X. Noninvasive intracranial pressure assessment based on a data-mining approach using a nonlinear mapping function. *IEEE Trans Biomed Eng.* 2012 Mar; 59(3):619-26. PMID: 21097375
36. Kim S, Hu X, McArthur D, Hamilton R, Bergsneider M, Glenn T, Martin N, Vespa P. Inter-subject correlation exists between morphological metrics of cerebral blood flow velocity and intracranial pressure pulses. *Neurocrit Care.* 2011 Apr; 14(2):229-37. PMID: 21136207
37. Kim S, Bergsneider M, Hu X. A systematic study of linear dynamic modeling of intracranial pressure dynamics. *Physiol Meas.* 2011 Mar; 32(3):319-36. PMID: 21285483
38. Asgari S, Subudhi AW, Roach RC, Liebeskind DS, Bergsneider M, Hu X. An extended model of intracranial latency facilitates non-invasive detection of cerebrovascular changes. *J Neurosci Methods.* 2011 Apr 15; 197(1):171-9. PMID: 21310179

39. Yang L, Zhao M, Peng C, Hu X, Feng H, Ji Z. Waveform descriptor for pulse onset detection of intracranial pressure signal. *Med Eng Phys.* 2012 Mar; 34(2):179-86. PMID: 21807549
40. Asgari S, Bergsneider M, Hamilton R, Vespa P, Hu X. Consistent changes in intracranial pressure waveform morphology induced by acute hypercapnic cerebral vasodilatation. *Neurocrit Care.* 2011 Aug; 15(1):55-62. PMID: 21052864
41. Asgari S, Vespa P, Bergsneider M, Hu X. Lack of consistent intracranial pressure pulse morphological changes during episodes of microdialysis lactate/pyruvate ratio increase. *Physiol Meas.* 2011 Oct; 32(10):1639-51. PMID: 21904021
42. Scalzo F, Asgari S, Kim S, Bergsneider M, Hu X. Bayesian tracking of intracranial pressure signal morphology. *Artif Intell Med.* 2012 Feb; 54(2):115-23. PMID: 21968205
43. Glenn TC, Sherma AK, McArthur DL, Hu X, Hanuscin CR, Furreedan MS, Hovda DA, Vespa PM, Martin NA. The linear relationship between transcranial Doppler pulsatility indices and intracranial pressure is influenced by traumatic brain injury and vasospasm. *Acta Neurochir Suppl.* 2012; 114:11-5. PMID: 22327657
44. Asgari S, Vespa PM, Bergsneider M, Hu X. Latency relationships between cerebral blood flow velocity and intracranial pressure. *Acta Neurochir Suppl.* 2012; 114:5-9. PMID: 22327656
45. Kasprowicz M, Bergsneider M, Czosnyka M, Hu X. Association between ICP pulse waveform morphology and ICP B waves. *Acta Neurochir Suppl.* 2012; 114:29-34. PMID: 22327660
46. Hamilton R, Dye J, Frew A, Baldwin K, Hu X, Bergsneider M. Quantification of pulsatile cerebrospinal fluid flow within the prepontine cistern. *Acta Neurochir Suppl.* 2012; 114:191-5. PMID: 22327691
47. Hu X, Hamilton R, Baldwin K, Vespa PM, Bergsneider M. Automated extraction of decision rules for predicting lumbar drain outcome by analyzing overnight intracranial pressure. *Acta Neurochir Suppl.* 2012; 114:207-12. PMID: 22327694
48. Scalzo F, Bergsneider M, Vespa PM, Martin NA, Hu X. Intracranial pressure signal morphology: real-time tracking. *IEEE Pulse.* 2012 Mar; 3(2):49-52. PMID: 22481746
49. Scalzo F, Hamilton R, Asgari S, Kim S, Hu X. Intracranial hypertension prediction using extremely randomized decision trees. *Med Eng Phys.* 2012 Oct; 34(8):1058-65. PMID: 22401795
50. Hu X, Sapov M, Nenov V, Barry T, Kim S, Do DH, Boyle N, Martin N. Predictive combinations of monitor alarms preceding in-hospital code blue events. *J Biomed Inform.* 2012 Oct; 45(5):913-21. PMID: 22465785
51. Scalzo F, Hao Q, Alger JR, Hu X, Liebeskind DS. Regional prediction of tissue fate in acute ischemic stroke. *Ann Biomed Eng.* 2012 Oct; 40(10):2177-87. PMID: 22592291

52. Scalzo F, Liebeskind D, Hu X. Reducing false intracranial pressure alarms using morphological waveform features. *IEEE Trans Biomed Eng.* 2013 Jan; 60(1):235-9. PMID: 22851230
53. Hamilton RB, Baldwin K, Vespa P, Bergsneider M, Hu X. Subpeak regional analysis of intracranial pressure waveform morphology based on cerebrospinal fluid hydrodynamics in the cerebral aqueduct and prepontine cistern. *Conf Proc IEEE Eng Med Biol Soc.* 2012 Aug; 2012:3935-8. PMID: 23366788
54. Lu J, Speier W, Hu X, Pouratian N. The effects of stimulus timing features on P300 speller performance. *Clin Neurophysiol.* 2013 Feb; 124(2):306-14. PMID: 22939456
55. Hamilton R, Baldwin K, Fuller J, Vespa P, Hu X, Bergsneider M. Intracranial pressure pulse waveform correlates with aqueductal cerebrospinal fluid stroke volume. *J Appl Physiol.* 2012 Nov; 113(10):1560-6. PMID: 22995390
56. Hu X, Gonzalez N, Bergsneider M. Steady-state indicators of the intracranial pressure dynamic system using geodesic distance of the ICP pulse waveform. *Physiol Meas.* 2012 Dec; 33(12):2017-31. PMID: 23151442
57. Kim S, Hamilton R, Pineles S, Bergsneider M, Hu X. Noninvasive intracranial hypertension detection utilizing semisupervised learning. *IEEE Trans Biomed Eng.* 2013 Apr; 60(4):1126-33. PMID: 23193303
58. Asgari S, Gonzalez N, Subudhi AW, Hamilton R, Vespa P, Bergsneider M, Roach RC, Hu X. Continuous detection of cerebral vasodilatation and vasoconstriction using intracranial pulse morphological template matching. *PLoS One.* 2012; 7(11):e50795. PMID: 23226385
59. Gonzalez NR, Hamilton R, Bilgin-Freiert A, Dusick J, Vespa P, Hu X, Asgari S. Cerebral hemodynamic and metabolic effects of remote ischemic preconditioning in patients with subarachnoid hemorrhage. *Acta Neurochir Suppl.* 2013; 115:193-8. PMID: 22890668
60. Tsiokos C, Hu X, Pouratian N. 200-300Hz movement modulated oscillations in the internal globus pallidus of patients with Parkinson's Disease. *Neurobiol Dis.* 2013 Jun; 54:464-74. PMID: 23388190
61. Xu P, Hu X, Yao D. Improved wavelet entropy calculation with window functions and its preliminary application to study intracranial pressure. *Comput Biol Med.* 2013 Jun 1; 43(5):425-33. PMID: 23566389
62. Scalzo F, Hu X. Semi-supervised detection of intracranial pressure alarms using waveform dynamics. *Physiol Meas.* 2013 Apr; 34(4):465-78. PMID: 23524637
63. Scalzo F, Alger JR, Hu X, Saver JL, Dani KA, Muir KW, Demchuk AM, Coutts SB, Luby M, Warach S, Liebeskind DS. Multi-center prediction of hemorrhagic transformation in acute ischemic stroke using permeability imaging features. *Magn Reson Imaging.* 2013 Jul; 31(6):961-9. PMID: 23587928

64. Asgari S, Vespa P, Hu X. Is there any association between cerebral vasoconstriction/vasodilatation and microdialysis lactate to pyruvate ratio increase? *Neurocrit Care*. 2013 Aug; 19(1):56-64. PMID: 23733172
65. Hu X, Do D, Bai Y, Boyle NG. A case-control study of non-monitored ECG metrics preceding in-hospital bradysystolic cardiac arrest: Implication for predictive monitor alarms. *J Electrocardiol*. 2013 Nov-Dec; 46(6):608-15. PMID: 24034301
66. Connolly M, He X, Gonzalez N, Vespa P, Distefano J, Hu X. Reproduction of consistent pulse-waveform changes using a computational model of the cerebral circulatory system. *Med Eng Phys*. 2014 Mar; 36(3):354-63. PMID: 24389244
67. Salas-Boni R, Bai Y, Harris PR, Drew BJ, Hu X. False ventricular tachycardia alarm suppression in the ICU based on the discrete wavelet transform in the ECG signal. *J Electrocardiol*. 2014 Aug 2. PMID: 25172188
68. Drew BJ, Harris P, Zègre-Hemsey JK, Mammone T, Schindler D, Salas-Boni R, Bai Y, Tinoco A, Ding Q, Hu X. Insights into the problem of alarm fatigue with physiologic monitor devices: a comprehensive observational study of consecutive intensive care unit patients. *PLoS One*. 2014; 9(10):e110274. PMID: 25338067.
69. Connolly M, Vespa P, Pouratian N, Gonzalez NR, Hu X. Characterization of the Relationship Between Intracranial Pressure and Electroencephalographic Monitoring in Burst-Suppressed Patients. *Neurocrit Care*. 2014 Aug 21. PMID: 25142827
70. Bai Y, Do DH, Harris PR, Schindler D, Boyle NG, Drew BJ, Hu X. Integrating monitor alarms with laboratory test results to enhance patient deterioration prediction. *J Biomed Inform*. 2014 Sep 18. PMID: 25240252
71. Salas-Boni R, Bai Y, Hu X. Cumulative Time Series Representation for Code Blue prediction in the Intensive Care Unit. *AMIA Jt Summits Transl Sci Proc*. 2015; 2015:162-7. PMID: 26306261.
72. Do DH, Hayase J, Tiecher RD, Bai Y, Hu X, Boyle NG. ECG changes on continuous telemetry preceding in-hospital cardiac arrests. *J Electrocardiol*. 2015 Nov-Dec; 48(6):1062-8. PMID: 26362882
73. Kim S, Scalzo F, Telesca D, Hu X. Ensemble of sparse classifiers for high-dimensional biological data. *Int J Data Min Bioinform*. 2015; 12(2):167-83. PMID: 26510301
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76. Ryu J, Hu X, Shadden SC. A Coupled Lumped-Parameter and Distributed Network Model for Cerebral Pulse-Wave Hemodynamics. *J Biomech Eng*. 2015 Oct 1; 137(10). PMID: 26287937

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78. Connolly M, He X, Gonzalez N, Hu X. Reproduction of ICP Waveform Changes in a Mathematical Model of the Cerebrospinal Circulatory System. *Acta Neurochir Suppl.* 2016; 122:313-6. PMID: 27165928
79. Ding Q, Bai Y, Erol YB, Salas-Boni R, Zhang X, Hu X. Robust QRS peak detection by multimodal information fusion of ECG and blood pressure signals. *Physiol Meas.* 2016 Nov; 37(11):N84-N95. PMID: 27734807
80. Miaskowski C, Cooper BA, Aouizerat B, Melisko M, Chen LM, Dunn L, Hu X, Kober KM, Mastick J, Levine JD, Hammer M, Wright F, Harris J, Armes J, Furlong E, Fox P, Ream E, Maguire R, Kearney N. The symptom phenotype of oncology outpatients remains relatively stable from prior to through 1 week following chemotherapy. *Eur J Cancer Care (Engl).* 2016 Jan 18. PMID: 26777053
81. Connolly M, Liou R, Vespa P, Hu X. Identification of an Intracranial Pressure (ICP) Response Function from Continuously Acquired Electroencephalographic and ICP Signals in Burst-Suppressed Patients. *Acta Neurochir Suppl.* 2016; 122:225-8. PMID: 27165911
82. Pelter MM, Loranger DL, Kozik TM, Kedia A, Ganchan RP, Ganchan D, Hu X, Carey MG. Among Unstable Angina and Non-ST-Elevation Myocardial Infarction Patients, Transient Myocardial Ischemia and Early Invasive Treatment Are Predictors of Major In-hospital Complications. *J Cardiovasc Nurs.* 2016 Jul-Aug; 31(4):E10-9. PMID: 26646595. PMCID: PMC4896865
83. Connolly M, Vespa P, Hu X. Characterization of Cerebral Vascular Response to EEG Bursts Using ICP Pulse Waveform Template Matching. *Acta Neurochir Suppl.* 2016; 122:291-4. PMID: 27165924
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85. Arroyo-Palacios J, Rudz M, Fidler R, Smith W, Ko N, Park S, Bai Y, Hu X. Characterization of Shape Differences Among ICP Pulses Predicts Outcome of External Ventricular Drainage Weaning Trial. *Neurocrit Care.* 2016 Apr 22. PMID: 27106888
86. Bai Y, Do D, Ding Q, Arroyo Palacios J, Shahriari Y, Pelter M, Boyle N, Fidler R, Hu X. Is the Sequence of SuperAlarm Triggers more Predictive than Sequence of the Currently Utilized Patient Monitor Alarms? *IEEE Trans Biomed Eng.* 2016 Jun 30. PMID: 27390164

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88. Pelter MM, Fidler R, Hu X. Research: Association of Low-Amplitude QRSs with False-Positive Asystole Alarms. *Biomed Instrum Technol.* 2016 Sep-Oct; 50(5):329-35. PMID: 27632038
89. Pelter MM, Stotts J, Spolini K, Nguyen J, Sin E, Hu X. Developing a Clinical Alarms Management Committee at an Academic Medical Center. *Biomed Instrum Technol.* 2017 Feb; 51(s2):21-29. PMID: 28296458
90. Fidler RL, Pelter MM, Drew BJ, Palacios JA, Bai Y, Stannard D, Aldrich JM, Hu X. Understanding heart rate alarm adjustment in the intensive care units through an analytical approach. *PLoS One.* 2017; 12(11):e0187855. PMID: 29176776. PMCID: PMC5703448
91. Winters BD, Cvach MM, Bonafide CP, Hu X, Konkani A, O'Connor MF, Rothschild JM, Selby NM, Pelter MM, McLean B, Kane-Gill SL. Technologic Distractions (Part 2): A Summary of Approaches to Manage Clinical Alarms With Intent to Reduce Alarm Fatigue. *Crit Care Med.* 2017 Nov 03. PMID: 29112077
92. Laurie SS, Vizzeri G, Taibbi G, Ferguson CR, Hu X, Lee SMC, Ploutz-Snyder R, Smith SM, Zwart SR, Stenger MB. Effects of short-term mild hypercapnia during head-down tilt on intracranial pressure and ocular structures in healthy human subjects. *Physiol Rep.* 2017 Jun; 5(11). PMID: 28611153.
93. Harris PR, ZÄgre-Hemsey JK, Schindler D, Bai Y, Pelter MM, Hu X. Patient characteristics associated with false arrhythmia alarms in intensive care. *Ther Clin Risk Manag.* 2017; 13:499-513. PMID: 28458554.
94. Shahriari Y, Fidler R, Pelter M, Bai Y, Villaroman A, Hu X. Electrocardiogram Signal Quality Assessment Based on Structural Image Similarity Metric. *IEEE Trans Biomed Eng.* 2017 Jun 21. PMID: 28644794
95. Meng L, Xiao J, Gudelunas K, Yu Z, Zhong Z, Hu X. Association of intraoperative cerebral and muscular tissue oxygen saturation with postoperative complications and length of hospital stay after major spine surgery: an observational study. *Br J Anaesth.* 2017 Apr 01; 118(4):551-562. PMID: 28403400
96. Kane-Gill SL, O'Connor MF, Rothschild JM, Selby NM, McLean B, Bonafide CP, Cvach MM, Hu X, Konkani A, Pelter MM, Winters BD. Technologic Distractions (Part 1): Summary of Approaches to Manage Alert Quantity With Intent to Reduce Alert Fatigue and Suggestions for Alert Fatigue Metrics. *Crit Care Med.* 2017 Jul 04. PMID: 28682835
97. Ryu J, Ko N, Hu X, Shadden SC. Numerical Investigation of Vasospasm Detection by Extracranial Blood Velocity Ratios. *Cerebrovasc Dis.* 2017 Feb 28; 43(5-6):214-222. PMID: 28241122

98. Liu X, Czosnyka M, Donnelly J, Cardim D, Cabelreira M, Hutchinson PJ, Hu X, Smielewski P, Brady K. Wavelet pressure reactivity index: a validation study. *J Physiol*. 2018 Apr 17. PMID: 29665012. PMCID: PMC6046066
99. Xiao R, King J, Villaroman A, Do DH, Boyle NG, Hu X. Predict In-Hospital Code Blue Events using Monitor Alarms through Deep Learning Approach. *Conf Proc IEEE Eng Med Biol Soc*. 2018 Jul; 2018:3717-3720. PMID: 30441177
100. Papachristou N, Barnaghi P, Cooper BA, Hu X, Maguire R, Apostolidis K, Armes J, Conley YP, Hammer M, Katsaragakis S, Kober KM, Levine JD, McCann L, Patiraki E, Paul SM, Ream E, Wright F, Miaskowski C. Congruence Between Latent Class and K-Modes Analyses in the Identification of Oncology Patients With Distinct Symptom Experiences. *J Pain Symptom Manage*. 2018 Feb; 55(2):318-333.e4. PMID: 28859882. PMCID: PMC5794511
101. Xiao R, Xu Y, Pelter MM, Fidler R, Badilini F, Mortara DW, Hu X. Monitoring significant ST changes through deep learning. *J Electrocardiol*. 2018 Aug 01. PMID: 30082087. PMCID: PMC6261793
102. Megjhani M, Alkhachroum A, Terilli K, Ford J, Rubinos C, Kromm J, Wallace BK, Connolly ES, Roh D, Agarwal S, Claassen J, Padmanabhan R, Hu X, Park S. An active learning framework for enhancing identification of non-artifactual intracranial pressure waveforms. *Physiol Meas*. 2018 Dec 18. PMID: 30562165
103. Xiao R, Xu Y, Pelter MM, Mortara DW, Hu X. A Deep Learning Approach to Examine Ischemic ST Changes in Ambulatory ECG Recordings. *AMIA Jt Summits Transl Sci Proc*. 2018; 2017:256-262. PMID: 29888083. PMCID: PMC5961830
104. Papachristou N, Puschmann D, Barnaghi P, Cooper B, Hu X, Maguire R, Apostolidis K, P Conley Y, Hammer M, Katsaragakis S, M Kober K, D Levine J, McCann L, Patiraki E, P Furlong E, A Fox P, M Paul S, Ream E, Wright F, Miaskowski C. Learning from data to predict future symptoms of oncology patients. *PLoS One*. 2018; 13(12):e0208808. PMID: 30596658. PMCID: PMC6312306
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107. Liu X, Zimmermann LL, Ho N, Vespa P, Liao X, Hu X. Evaluation of a New Catheter for Simultaneous Intracranial Pressure Monitoring and Cerebral Spinal Fluid Drainage: A Pilot Study. *Neurocrit Care*. 2018 Dec 03. PMID: 30511345
108. Liu X, Zimmermann LL, Ho N, Vespa P, Liao X, Hu X. Cerebral Vascular Changes During Acute Intracranial Pressure Drop. *Neurocrit Care*. 2018 Dec 06. PMID: 30523541

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110. Wang JX, Hu X, Shadden SC. Data-Augmented Modeling of Intracranial Pressure. *Ann Biomed Eng*. 2019 Jan 03. PMID: 30607645
111. Tinoco A, Mortara DW, Hu X, Sandoval CP, Pelter MM. ECG derived Cheyne-Stokes respiration and periodic breathing are associated with cardiorespiratory arrest in intensive care unit patients. *Heart Lung*. 2019 Mar - Apr; 48(2):114-120. PMID: 30340809. PMCID: PMC6430649
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114. Hamilton RB, Scalzo F, Baldwin K, Dorn A, Vespa P, Hu X, Bergsneider M. Opposing CSF hydrodynamic trends found in the cerebral aqueduct and prepontine cistern following shunt treatment in patients with normal pressure hydrocephalus. *Fluids Barriers CNS*. 2019 Jan 22; 16(1):2. PMID: 30665428. PMCID: PMC6341759
115. Hu X. An algorithm strategy for precise patient monitoring in a connected healthcare enterprise. *NPJ Digit Med*. 2019; 2:30. PMID: 31304377. PMCID: PMC6550269
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120. Liu X, Pu Y, Wu D, Zhang Z, Hu X, Liu L. Cross-Frequency Coupling Between Cerebral Blood Flow Velocity and EEG in Ischemic Stroke Patients With Large Vessel Occlusion. *Front Neurol*. 2019; 10:194. PMID: 30915019.

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122. Pereira T, Ding C, Gadhoumi K, Tran N, Colorado R, Meisel K, Hu X. Deep Learning approaches for Plethysmography Signal Quality Assessment in the Presence of Atrial Fibrillation. Physiological Measurement. 2019 Dec 27;40(12):125002. doi: 10.1088/1361-6579/ab5b84
123. Liu X, Gudelunas K, Ho N, Hetts S, Ko N, Hu X. Morphological Changes of Intracranial Pressure Quantifies Vasodilatory Effect of Verapamil to Treat Cerebral Vasospasm. Journal of NeuroInterventional Surgery. 2020 Jan 20. pii: neurintsurg-2019-015499. doi: 10.1136/neurintsurg-2019-015499.
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127. Pelter MM, Suba S, Sandoval C, Zègre-Hemsey JK, Berger S, Larsen A, Badilini F, Hu X. Actionable Ventricular Tachycardia During In-hospital ECG Monitoring and its Impact on Alarm Fatigue. Cardiol Rev. 2020 Feb 24. doi: 10.1097/HPC.0000000000000216. [Epub ahead of print]
128. Xiao R, Do D, Ding C, Meisel K, Lee RJ, Hu X. Generalizability of SuperAlarm via Cross-Institutional Performance Evaluation. IEEE Access 8, 132404-132412.
129. Gunn CA, Hu X, Vandenberghe L. Artifact rejection and missing data imputation in cerebral blood flow velocity signals via trace norm minimization [published online ahead of print, 2020 Jul 10]. Physiol Meas. 2020;10.1088/1361-6579/aba492. doi:10.1088/1361-6579/aba492
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131. Liu X, Czosnyka M, Donnelly J, et al. Assessment of cerebral autoregulation indices - a modelling perspective. Sci Rep. 2020;10(1):9600. Published 2020 Jun 15. doi:10.1038/s41598-020-66346-6.

- 132 Do DH, Yang JJ, Kuo A, et al. Electrocardiographic right ventricular strain precedes hypoxic pulseless electrical activity cardiac arrests: Looking beyond pulmonary embolism. *Resuscitation*. 2020;151:127-134. doi:10.1016/j.resuscitation.2020.04.024
- 133 Liu X, Hu X, Brady KM, et al. Comparison of wavelet and correlation indices of cerebral autoregulation in a pediatric swine model of cardiac arrest. *Sci Rep*. 2020;10(1):5926. Published 2020 Apr 3. doi:10.1038/s41598-020-62435-8
- 134 Rashidinejad P, Hu X, Russell S. Patient-adaptable intracranial pressure morphology analysis using a probabilistic model-based approach. *Physiological Measurement* 41 (10), 104003
- 135 Linnen DT, Hu X, Stephens CE. Postimplementation Evaluation of a Machine Learning–Based Deterioration Risk Alert to Enhance Sepsis Outcome Improvements. *Nursing Administration Quarterly* 44 (4), 336-346
- 136 Zhang O., Ding C., Pereira T., Xiao R., Gadhoumi K., Meisel K., Lee J Randall, Chen Y., and Hu X. Explainability Metrics of Deep Convolutional Networks for Photoplethysmography Quality Assessment. *IEEE Access*. PP. 1-1. 10.1109/ACCESS.2021.3054613.
- 137 Gadhoumi K., Beltran A, Scully C, Xiao R, Nahmias D, Hu X. Technical considerations for evaluating clinical prediction indices: a case study for predicting code blue events with MEWS. *Physiological Measurement* (2021), Volume 42, Number 5, 055005.
- 138 Yang JJ, Hu X, Boyle NG, Do DH, Novel Approaches to Risk Stratification of In-Hospital Cardiac Arrest, *Current Cardiovascular Risk Reports* (2021) 15 (3), 1-12.
- 139 Megjhani M, Terilli K, Kaplan A, Wallace BK, Alkhachroum A, Hu X, Park S. Use of Clustering to Investigate Changes in Intracranial Pressure Waveform Morphology in Patients with Ventriculitis. *Acta neurochirurgica. Supplement* (2021) 131, 59-62

In press

Submitted or in review

Ding C, Gadhoumi K., Meisel K., Lee J R., and Hu X. (2021)
Photoplethysmography based Atrial Fibrillation Detection: Can data augmentation improve the performance? *Artificial Intelligence in Medicine*

Ding C, Pereira T., Xiao R., Nate T., Meisel K., Lee J R. and Hu X. (2021) Impact of Label Noise on the Learning Based Models for a Binary Classification of Physiological Signal. *Computer Methods and Programs in Biomedicine*.

1. **Non-refereed publications:**

None

Published

1. Hu X. Physiological Measurement: a vital piece of the puzzle of precision medicine and health. Physiological Measurement 41 (2), 020401

In press

- 1.

Submitted or in review

- 1.

2. **Chapters in books:**

Published

1. Cattivelli, S.F, Asgari S, Sayed A, Bergsneider M, Hu X Use of Constrained Nonlinear Kalman Filtering to Detect Pathological Constriction of Cerebral Arterial Blood Vessels, Application of Kalman Filter to be published by I-Tech Education and Publishing. (2009). ISBN 978-953-307-000-1.
2. F. Scalzo, R. Hamilton, and X. Hu. Real-time analysis of intracranial pressure waveform morphology. Neurological Disorders, 2011, ISBN 978-953-307-799-4.
3. F. Scalzo, X. Hu, and D. Liebeskind. Tissue fate prediction from regional imaging features in acute ischemic stroke, 2011, Neuroimaging ISBN 3-642-17273-3;

In press

- 1.

Submitted or in review

- 1.

3. **Books:**

None

Published

- 1.

In-Press

- 1.

Submitted or in review

- 1.

a. Non-authored publications:

Published

1.

In press

1.

Submitted or in review

1.

5. Other:

a. Published expert panel reviews, consensus statements, practice guidelines, etc.

1.

b. Published abstracts

1.

c. Editorials, position, and background papers

1.

d. Distributed / disseminated works in other media

1.

e. Patents Issued or Pending

Musical Skates, with Nenov V, US 7673907 (issued on 3/9/2010)

Voice-Controlled Clinical Information Dashboard, with Nenov V. US8688459 (issued on 4/1/2014)

Generation and Dissemination of Automatically Pre-Populated Clinical Notes, with Martin N, Buxey F, Nenov V. US8805703B2 (issued 8/12/2014)

Patient Monitoring, with Martin N, Buxey F, Sapov M. US 8510126 (issued on 8/13/2013)

PACS optimization techniques, with Platt C, Zlatev V, Buxey F. US8634677 (issued on 1/21/2014)

A Framework for Data Mining Based Noninvasive Intracranial Pressure Assessment, with Martin N. and Nenov V. US20100049082 (issued 8/2014).

System and methods for generating predictive combinations of hospital monitor alarms, with Martin N. US9600990B2 (issued on 3/21/2017)

Recognizing Predictive Patterns in the Sequence of SuperAlarm Triggers for Predicting Patient Deterioration. US10811141B2 (issued on 10/20/2020)

Methods for Determining Whether a VT Monitor Alarm is True or False Based on a Multi-resolution Wavelet Transform and Inter-Leads Variability. US10357169B2 (issued on 7/23/2019)

Media Coverage *(list by type)*

Making Digital Sense of the Body's Complex Signal.

<https://scienceofcaring.ucsf.edu/profiles-nursing/making-digital-sense-body%E2%80%99s-complex-signals>

Nerds and Nurses' Race to Develop Super Alarm to Combat Alarm Fatigue

<https://scienceofcaring.ucsf.edu/research/%E2%80%99Cnerds-and-nurses%E2%80%99D-race-develop-super-alarm-combat-alarm-fatigue>

A Voyage Without a Map: Improving Alarm Safety at UCSF Medical Center

<https://scienceofcaring.ucsf.edu/patient-care/voyage-without-map-improving-alarm-safety-ucsf-medical-center>

Battling Alarm Fatigue

<https://scienceofcaring.ucsf.edu/patient-care/battling-alarm-fatigue>

What Clinicians Need to Know About Genomic Testing

<https://scienceofcaring.ucsf.edu/research/what-clinicians-need-know-about-genomic-testing>

The Time Is Now for Precision Patient Monitoring

<https://scienceofcaring.ucsf.edu/research/time-now-precision-patient-monitoring>

The dedicated who are racing to eliminate alarm fatigue in hospitals

<https://medium.com/ucsf-magazine/solving-the-hardest-problems-in-health-4fe35d5118e0>

Faculty Spotlight: Xiao Hu, PhD

<https://neurology.duke.edu/about/news/faculty-spotlight-xiao-hu-phd>

DUSON Faculty Lead Prestigious Journals as Chief Editors

<https://nursing.duke.edu/news/duson-faculty-lead-prestigious-journals-chief-editors>

Presentations *(not included in abstracts above)*

b. Invited Presentations

<u>Presentation</u>	<u>Date</u>
1. 9 th UC Neurotrauma Meeting	2007

<u>Presentation</u>	<u>Date</u>
2. School of Bioengineering, University of ChongQing, China / Translational Biomedical Informatics Research	2010
3. Division of Neurosurgery, University of Cambridge, UK / Translational Biomedical Informatics Research in a neurosurgical /Neurological Environment	2010
4. Department of Biomedical Informatics, Arizona State University / Give a talk on Real-time Analytics by the Bedside	2012
5. Department of Biostatistics, UCLA / Give a talk on Mapping Function Learning in a Noninvasive Intracranial Pressure Assessment Framework	2012
6. Brain and Spinal Injury Center San Francisco General Hospital	2013
7. Integrated Medical Environment Decision Support (IMEDS) consortium Team Meeting / Algorithm Candidates for Multi-site Validation	2013
8. UCSF Leadership Roundtable Breakfast with U.S. Rep. Dan Lipinski / Invited Discussant	2013
9. 2 nd IBM ExcelMedical Streams Analytics Meeting / UCLA-IBM Streams Proof of Concept Project	2013
10. International Society of Computerized Electrocardiography / Integrated Utilization of Monitor Alarms to Detect Patient Deterioration	2013
11. National Institute of Nursing Research Innovative Question Workshop / Invited Participants	2014
12. GE-UCSF Summit on Patient Monitoring and Alarm Fatigue / Invited Speaker	2014
13. Kaiser Permanente Division of Research / Invited presenter “SuperAlarm Technology to Detect Patient Deterioration and Alleviate Alarm Fatigue	2014
14. UCSF Deep Learning Workshop / Invited presenter “SuperAlarm to Detect Patient Deterioration and Alleviate Alarm Fatigue	2014
15. Smart Monitoring 2014 / Invited Speaker	2014
16. Brain Physics Lab, Division of Neurosurgery, University of Cambridge, UK / Noninvasive Intracranial Pressure Algorithm	2015
17. School of Nursing’s Hot Topic – Showcasing Innovations and Entrepreneurship / Invited Panel Member	2015
18. Chongqing University of Science and Technology, Chongqing, China / Biomedical informatics approaches to detect patient deterioration	2016

<u>Presentation</u>	<u>Date</u>
19. 14 th UC-System Wide Bioengineering Symposium / Invited Speaker	2016
20. Neurocritical Care Symposium – Beijing China / Invited Keynote Speaker	2016
21. University of Leuven- KU / Discover and Deliver Insights from Data for Clinical Decision Support	2016
22. Interface Group at University of Zurich / Intracranial Pressure Monitoring 2.0	2016
23. NASA-NSBRI Ultrasound Workshop / Invited Speaker	2016
24. Working Group on Neurocritical Care Informatics Annual Meeting / Invited Speaker	2016
25. Dahshu 2017: Data Science & Computational Precision Health Symposium / Invited Speaker	2017
26. UCSF Share Case 2017: Precise Patient Monitoring with Few False Alarms – SuperAlarm	2017
27. Vasospasm 2017: ICP Monitoring: an Untapped Tool for Cerebrovascular Monitoring	2017
28. CSSA- Stanford 2017: Precise Patient Monitoring with Few False Alarms – SuperAlarm	2017
29. European Patent Office visit: Algorithm Strategies for Precise Patient Monitoring	2018
30. Shenzhen Institutes of Advanced Technology (SIAT) of the Chinese Academy of Science: Discover and Deliver Insights from Data for Clinical Decision Support	2018
31. Neurocritical Care Symposium – Beijing China / Invited Keynote Speaker	2018
32. International society of computerized electrocardiography: Algorithm Strategies for Precise Patient Monitoring	2018
33. Google Catalyst: SuperAlarm to Detect Patient Deterioration	2018
34. UCSF-Stanford biomedical informatics symposium: Algorithm Strategies for Precise Patient Monitoring	2019
35. IEEE Biomedical Health Informatics: Algorithm Strategies for Precise Patient Monitoring	2019
36. UCLA ICU of the Future Symposium: High Resolution Signal Analysis	2019

<u>Presentation</u>	<u>Date</u>
37. FDA Weekly Science Sharing: Algorithm Strategies for Precise Patient Monitoring	2019
38. NASA OH Data Summit: Data Driven Noninvasive Intracranial Pressure	2019
39. Neurocritical Care Symposium – Beijing China / Invited Keynote Speaker	2019
40. Duke Anesthesiology Grand Round - A Vision and Algorithm Strategy for Precise Patient Monitoring	2020
41. Duke Neurology Grand Round - High Resolution Physiologic Signal Analysis – a Central Piece to Enable Precision Neocritical Care	2020
42. Invited talk to SCOR consortium - Introducing CHoRUS Consortium to SCOR	2020
43. Invited talk at UCSF Health Hub - Algorithms: The Key to Remote Patient Monitoring	2020
44. Invited talk at CARNet 10 th annual meeting: Learning to Predict Delayed Cerebral Ischemia	2021
45. Invited talk at DUSON AI workshop: Future of AI in Healthcare	2021

b. Selected Other Presentations

<u>Presentation</u>	<u>Date</u>
1.	
Consultant appointments:	
None	
<u>Appointment</u>	<u>Date(s)</u>

Professional awards and special recognitions:

<u>Award</u>	<u>Date(s)</u>
Honorary thesis / University of Electronic Science and Technology of China	2006
Graduation with Honor / the Ministry of Electronics of China	2006
Clinical and Translational Science Institute Scholar/ University of California, Los Angeles	2008

Spring 2012 Venture Competition Grand Price. Algorithm for Continuous Brain Assessment Using Intracranial Pressure Measurements. / UCLA Business of Science Center	2012
Winner of NASA Innocentive Challenge on Noninvasive Intracranial Pressure / NASA Innocentive	2013
SMART Award at the 16th International Symposium on Intracranial Pressure and Neuromonitoring / Cerebral Autoregulation Research Network	2016

Professional organizations and participation: (*offices held, committee assignments, etc.*)

<u>Professional Organization</u>	<u>Office Held and/or Committee Assignment</u>	<u>Dates</u>
IEEE	Session chair at IEEE EMBC annual conference	2008
Elected-secretary for the IEEE Coast Los Angeles Section		2010-2011
International Symposium on Intracranial Pressure and Neuromonitoring	Session chair	2010
IEEE	Mini-symposium co-chair at IEEE EMBC annual conference	2013
International society of computerized electrocardiography	Session chair	2014
International society of computerized electrocardiography	Session chair	2015
Society of Critical Care Medicine	Task Force Member for Physiologic Noise and Alert Fatigue	2015-2017
Working Group on Neurocritical Care Informatics	Steering Committee Member	2016
International society of computerized electrocardiography	Session co-chair for annual meeting	2018
Data Science Institute Lawrence Livermore National Lab	Session chair of 2019 Data Science Symposium	2019
Basic and Clinical Multimodal Imaging (BaCI)	Session chair for 2019 Conference	2019

Editorial boards:

- 2008 - 2012 Ad-hoc Reviewer for Journals: Medical & Biological Engineering & Computing (2), Neurosurgery (1), Critical Care (2), Artificial Intelligence in Medicine (3), International Journal of Electronics and communications (1), Journal of Applied Physiology (2), Journal of Neurotrauma (1), IEEE Transactions on Biomedical Engineering (2), Journal of Neuroscience Methods(2), Physiological Measurement (7), Biomedical Signal Processing&Control (1), Neurological Research (1), Brain Research (1), PLoS ONE (2), Computer Methods and Programs in Biomedicine (2), Journal of Electrocardiography (1), American Journal of Physiology: Heart and Circulatory Physiology (1), Annals of Biomedical Engineering (1), Journal of Cerebral Blood Flow and Metabolism (1)
- 2013 - Ad-hoc Reviewer for Journals/Conferences: Biomedical Engineering Online (1); IEEE Neural Engineering meeting (2); Journal of Biomedical Informatics (3); Biomedical Signal Processing&Control (1); Physiological Measurement (2); Journal of Electrocardiograph (1); Medical Engineering and Physics (1); Computer Methods and Programs in Biomedicine (1)
- 2014 - Ad-hoc Reviewer for Journals/Conferences: Journal of Biomedical Informatics (1); Physiological Measurement (3); Journal of Electrocardiograph (1); Medical Engineering and Physics (1); Entropy (1); Journal of Neuroscience Methods (1); Ophthalmology(1); Computer Methods and Programs in Biomedicine (1)
- 2015 - Ad-hoc Reviewer for IEEE Transactions on Biomedical Engineering (1), Physiological Measurement (2), Journal of Applied Physiology (2), Journal of Cerebral Blood Flow and Metabolism (1), Journal of Clinical Monitoring and Computing (1), Journal of Biomedical Informatics (2), Renal Failure (1), Computer Methods and Programs in Biomedicine(1)
- 2016 - Ad-hoc Reviewer for Journal of Applied Physiology (1), IEEE Transactions on Biomedical Engineering (1), Journal of NeuroTrauma (1), IEEE Transactions on Biomedical Circuits and Systems(1), BMC Nursing (1), Computer Methods and Programs in Biomedicine (1), Journal of Biomedical Informatics(1), Medical Engineering and Physics (2), Physiological Measurement (3)
- 2017 - Physiological Measurement (5), Journal of Neurotrauma(1), Critical Care Medicine (1), Pediatrics (1), European Journal of Pharmaceutical Sciences(1), Journal of Neurophysiology(1), BMC Medical Informatics and Decision Making(1), IEEE Transactions on Biomedical Engineering(2), Journal of Electrocardiogram (1)
- 2018 - IEEE Journal of Biomedical and Health Informatics (2), IEEE Transactions on Biomedical Engineering (4), Physiological Measurement (3), PLOS ONE(1), Neurocritical Care (3), Journal of Biomedical Informatics (2)
- 2019 - Cancer Control (1), Neurocritical Care(1), Physiological Measurement(1), IEEE Transactions on Biomedical Engineering (1), Journal of Biomedical Informatics (1), MethodX (1)

- 2020 - Physiological Measurement (5), IEEE Transactions on Biomedical Engineering (1), Artificial Intelligence in Medicine (2), Sensors (1), NPJ Digital Medicine (1), Translational Stroke Research (1)
- 2021- Physiological Measurement (3), Management Science(1), IEEE Journal of Biomedical and Health Informatics(1),

Grant Reviews/Review Panels:

<u>Institution</u>	<u>Position/Title</u>	<u>Dates (Year)</u>
SPARKS foundation	Mail-in grant reviewer	2008
National Institutes of Health	Grant proposal reviewer for NIH CSR ZRG1 HDM-E(99) Research and Research Infrastructure GO Special Emphasis Panel	2009
Italian Ministry of Health	International grant proposal reviewer	2009
USAMRMC	Mail-in grant reviewer	2010
MARSDEN FUND proposal, New Zealand	Mail-in grant reviewer	2011
National Institute of Academic Anesthesia (UK)	Mail-in grant reviewer	2011
National Science Foundation	Ad-hoc grant reviewer	2012
American Institute of Biological Sciences	Mail-in reviewer	2013
National Aeronautics and Space Administration	Grant proposal review member for NASA VIIP panel	2013
Physicians' Services Incorporated Foundation	Grant proposal reviewer	2013
National Institutes of Health	Grant proposal reviewer for 2013/10 ZNS1 SRB-N (04).National Institute of Neurological Disorders and Stroke Special Emphasis Panel	2013
Italian Ministry of Health	International grant proposal reviewer	2013
Italian Ministry of Health	International grant proposal reviewer	2015

National Institutes of Health	Grant proposal reviewer for study section ETTN10	2015
National Institutes of Health	Grant proposal reviewer for study section ETTN10	2016
National Institutes of Health	Grant proposal reviewer for study section BCHI	2016
National Aeronautics and Space Administration	Grant proposal review member for NASA VIIP panel	2017
Sinergia funding instrument of the Swiss National Science Foundation	Grant proposal reviewer	2017
Netherlands Organisation for Scientific Research (NWO)	Grant proposal reviewer	2017
NASA	HERO Grant proposal reviewer	2018
National Institutes of Health	Standing Member (BCHI)	2017-2021

Teaching responsibilities:

Classroom and Online Teaching:

<u>Course Number</u>	<u>Course Name</u>	<u>Dates: Semester/Year</u>
CS&B 184	INTRODUCTION TO Computational and Systems Biology	2010 – 2010
CS&B 185	Thesis research opportunities in Computational and Systems Biology	2010 – 2010
CS&B 184	INTRODUCTION TO Computational and Systems Biology	2012 – 2012
CS&B 185	Thesis research opportunities in Computational and Systems Biology	2013 – 2013
N248	Machine Learning-Primer	2016
N269A	Machine Learning-Primer	2017
N278B	Advanced Quantitative Approaches	2019
N724	Data Analytics II	2021

Continuing Education:

None

<u>Location</u>	<u>Audience</u>	<u>Course Title</u>	<u>Date(s)</u>
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Pre-Doctoral Supervision; Faculty Mentoring

1. Robert Hamilton 2009 – 2013 (UCLA Biomedical Engineering, Ph.D student)
2. Mahsa Malekmohammadi 2010 – 2014 (UCLA Biomedical Engineering, Ph.D student)
3. Sungwon Yang 2010 – 2013 (Staff UCLA Computer Science, Ph.D. student)
4. Christos Tsiokos 2010 – 2013 (UCLA Biomedical Engineering, Ph.D student)
5. Jessica Lu 2011 – 2012 (Biomedical Engineering, Master student)
6. Yong Bai 2011 – 2016 (Biomedical Engineering, Master student)
7. Tina Mammone 2012 – 2014 (UCSF Physiological Nursing, Ph.D. student)
8. Richard Filder 2013 – 2014 (UCSF Physiological Nursing, Ph.D. student)
9. Adelita Tinoco 2014 – 2016 (UCSF Physiological Nursing, Ph.D. student)
10. Cameron Allan Gun 2014 (UCLA PhD Student in Electrical Engineering)
11. Daniel Linnen 2015 (UCSF PhD Student in Health Policy SON)
12. Sameh Saleh 2016 – 2016 (University of Virginia Medical School student)
13. Nhi Ho 2017 (UCSF Medical School Student)
14. Koa Gudelunas 2016 (NIH post-bachelor diversity supplement awardee)
15. Weina Chen 2015 – 2016 (UCSF MTM student)
16. Jason Wen 2015 – 2016 (UCSF MTM student)
17. Alex Kim 2015 – 2016 (UCSF MTM student)
18. Milan Amin 2016 – 2017 (UCSF MTM student)
19. Carissa Santos 2016 – 2017 (UCSF MTM student)
20. Rae Chen 2016 – 2017 (UCSF MTM student)
21. Narinder Singh 2016 – 2017 (UCSF MTM student)
22. Mitchell Ma 2016 – 2017 (UC Berkeley undergraduate student)
23. Jonathan King 2016 – 2017 (UC Berkeley undergraduate student)
24. Robin Ma 2016 – 2017 (SF State undergraduate student)
25. Kavya Katipally 2016 – 2017 (SF State undergraduate student)
26. Nate Tran 2017 (UC Berkeley-UCSF joint graduate program in Bioengineering)

27. Alex Beltran 2018 (UC Berkeley-UCSF joint graduate program in Bioengineering)
28. Sara Qi 2020 (Master student in Duke BME)
29. Cheng Ding 2020 (PhD student in Duke ECE program)
30. Lin Duan 2020 (PhD student in Duke ECE program)
31. Se Hee Min 2020 (PhD student in DUSON)
32. Hideyo Tsumura 2020 (PhD student in DUSON)
33. Fangyi Chen 2020 (Master student in Duke BME)

**Graduate and Post-Doctoral Supervision; Faculty Mentoring
Post-Doctoral Fellows or Associates:**

Direct Supervisor

1. Peng Xu 2007 – 2009 (Professor, University of Electronic Science and Technology of China)
2. Magdalena Kasproicz 2008 – 2009 (Assistant professor, Institute of Biomedical Engineering and Instrumentation, Wroclaw University of Technology, Poland.)
3. Shadnaz Asgari 2008 – 2009 (Associate Professor, Cal State Long Beach)
4. Fabien Scalzo 2009 – 2012 (Assistant Professor, Neurology, UCLA)
5. Sunghan Kim 2010 – 2012 (Assistant professor, East Carolina State University)
6. Quan Ding 2013 – 2015 (Senior Data Scientist at RedBeacon)
7. Rebeca Salas-Boni 2013 – 2015 (Senior Data Scientist at Apple Inc)
8. Jaiyoung Ryu 2014 – 2016 (Assistant Professor, School of Mechanical Engineering, Chung-Ang University, Seoul, Korea)
9. Jorge Arroyo 2015 – 2016 (Research Engineer, Sony Interactive Entertainment America)
10. Yalda Shahriari 2015 – 2016 (Assistant Professor, University of Rhode Island)
11. Yuan Wang 2015 – 2016
12. Valeria De Luca 2016 – 2017 (Data scientist, Novartis Institutes for BioMedical Research)
13. Ran Xiao 2017 – 2018 (Assistant Researcher)
14. Kais Gadhomi 2017 – 2018 (Assistant Researcher)
15. Mary Liu 2017 – 2019 (Postdoctoral fellow, Johns Hopkins)
16. Tania Pererira 2017 – 2019 (Staff researcher, University of Porto)

17. Syed Bashir 2021 -

Project Mentoring:

1. Lara Zimmerman 2016 – 2016 (Assistant professor and attending physician at UC David)
2. Scott Caganap 2016 – 2017 (Neurocritical fellow at UCLA Medical Center)

Faculty Mentoring:

1. Patricia Harris 2013 – 2014 (Assistant Professor at Dominican University of California)
2. Jill Howie-Esquivel 2014 (Assistant Professor)
3. Rich Fidler 2015 (Adjunct Assistant Professor)
4. Ran Xiao 2018 (Assistant Researcher)
5. Kais Gadhumi 2018 (Assistant Researcher)
6. Priya Prasad 2019 (Adjunct Assistant Professor)

Visiting Faculty Mentored:

1. Shaozhi Wu 2007 – 2009 (University of Electronic Science and Technology of China) (UESTC)
2. Mingxi Zhao 2010 – 2011 (Chongqing University, China)
3. Xiangming Guo 2010 – 2011 (Chongqing University, China)
4. Carolina Varon 2016 – 2016 (KU Leuven, Belgium)
5. Griet Goovaerts 2017 – 2017 (KU Leuven, Belgium)
6. Dan Wu 2017 2017 (Beijing Jiaotong University, China)

PhD Dissertations

1. Using Multi-Modality Measurements to Investigate Intracranial Pressure Waveform Morphology in Patients with Normal Pressure Hydrocephalus, Robert Hamilton, UCLA, 2014
2. SuperAlarm: System and Methods to Predict In-Hospital Patient Deterioration and Alleviate Alarm Fatigue, Yong Bai, UCLA, 2016
3. Subcortical-Cortical Network Dynamics in the Human Brain, Mahsa Malekmohammadi, UCLA, 2015
4. Phase-Amplitude Cross-Frequency Coupling in the Globus Pallidus Internus and Motor Cortex of Patients with Parkinson's Disease, Christos Tsiokos, UCLA, 2015
5. Effects of Nursing Interventions on Physiologic Monitor Alarm Rates in a Neuroscience Intensive Care Unit, Tina Mammone, UCSF, 2014

6. Tensor-based ECG analysis in sudden cardiac death, Griet Goovaerts, KU Leuven Belgium, 2018
7. Convex Optimization Methods for System Identification with Applications to Noninvasive Intracranial Pressure Estimation, Cameron Gunn, UCLA, 2018
8. Determining the Ideal Electrode Configuration for Continuous In-Hospital ECG Monitoring, Richard Fidler, UCSF, 2014
9. Electrocardiographic Derived Cheyne-Stokes Respiration and Periodic Breathing in Healthy, Hospitalized and Critically Ill Cohorts, Adelita Tinoco, UCSF, 2017
10. Alert Driven Rescue: Do In-hospital Sepsis Interventions Following an Advanced Early Warning System Alert Differ Substantially Between Decedents and Survivors, Daniel Linnen, UCSF, 2018
11. Bayesian Curve Registration and Warped Functional Regression, Lu Wang, UCLA, 2018

DNP Capstone Projects

None

1.

Master's Theses / Research Projects

Characterizing P300 Speller Performance: The Effects of Stimulus Timing Features and Search for a Physiological Biomarker, Jessica Lu, 2012

SuperAlarm: UCSF- UC Berkeley Master in Translational Medicine capstone project, 2016 - 2017

SuperAlarm: UCSF- UC Berkeley Master in Translational Medicine capstone project, 2015- 2016

CalCardiac: Classifying Heartbeats Using Machine Learning: UC Berkeley Master of Engineering capstone project, 2016 - 2017

IntelliCare – Machine Learning to Support Hospital Heart Rate Monitor: UC Berkeley Master of Engineering capstone project, 2017 - 2018

Silence Excessive Beeps to Fight Alarm Fatigue in Hospitals: UC Berkeley Master of Engineering capstone project, 2017 - 2018

Faculty Mentoring

None

Areas of research interest (list):

Big Data analytics, biomedical signal processing, mathematical modeling, system identification, machine learning, reinforcement learning, neurocritical care, physiological monitoring, ambulatory monitoring, brain computer interface, computer software, intracranial pressure,

cerebral blood flow, neurovascular coupling, hydrocephalus, cardiac arrest prediction, alarm fatigue

External support - gifts, grants, and contracts:

1. Research Support

Research: Present—Currently Active

Project Number: R01NS113541

Status on Grant: Principal Investigator

Approved Project Period: 9/1/2020 - 5/30/2025

% Effort: 15%

PI: Xiao Hu

Source: NIH

Annual Direct Costs: \$832,851 (total \$3,248,944)

Title of Project: Learning to Predict Delayed Cerebral Ischemia and Make Optimal Decisions during Endovascular Treatment

Project Goal: The goal of this project is to develop and validate predictive models of delayed cerebral ischemia and reinforcement learning algorithms for intra-operative decision support to treat distal cerebral vasospasm.

Project Number: R01 NS089771-A1

Status on Grant: Principal Investigator

Approved Project Period: 12/1/2018 – 11/30/2023

% Effort: 20%

PI: Xiao Hu, PhD

Source: NIH/NINDS

Annual Direct Costs: \$497,303 (total \$ 2,486,515)

Title of Project: Development and Validation of a Novel Noninvasive Intracranial Pressure Approach

Project Goal: This project will support the development and validation of a novel noninvasive intracranial pressure estimation algorithm that is built upon a principled convex optimization framework. The framework integrates dynamic system modeling and machine learning approaches to solve a challenging estimation problem and has the potential to finally achieve accurate noninvasive intracranial pressure estimation.

Project Number: R01 NS097782-01A1

Status on Grant: DUKE Subcontract PI

Approved Project Period: 9/30/2016 – 8/31/2021

% Effort: 10%

PI: Nader Pouratian, MD, PhD

Source: NIH/NINDS

Annual Direct Costs:

Title of Project: The Pathophysiology of Network Synchrony in Parkinson's disease

Project Goal: This subcontract award to UCSF is to support Dr. Hu to develop novel signal processing methods for multichannel local field potentials that will be recorded during DBS

treatment of Parkinson patients with the ultimate goals to using these tools to detect and understand network level synchrony changes.

Project Number: W14-DA-72613

Status on Grant: UCSF Subcontract PI

Approved Project Period: 9/30/2016 – 9/29/2017

% Effort: 5%

PI: Xiao Hu, PhD

Source: Wyle Lab Inc / NASA Subcontract

Annual Direct Costs:

Title of Project: Prospective Observational Study of Ocular Health in ISS Crews (Ocular Health)

Project Goal: Dr. Hu will be responsible for training the postdoctoral fellow in the application and/or further development of the noninvasive ICP framework to analyze the study data. He will be responsible for communicating with the NASA team on all study-related matters and participate in the results reporting and dissemination.

Project Number: NNJ15HK11B

Status on Grant: PI of UCSF Subcontract

Approved Project Period: 01/01/2017 - 12/31/2024

% Effort: 4%

PI: Xiao Hu

Source: Wyle Lab Inc / NASA Subcontract

Annual Direct Costs: \$ 258,088 direct/yr 1 (total \$ 864,936 total)

Title of Project: Multimodal Modeling towards Noninvasive Assessment of Intracranial Pressure in Weightlessness and Biomarker Identification of Predisposition to VIIP Syndrome

Project Goal: Dr. Hu will be responsible for training the postdoctoral fellow in the application and/or further development of the noninvasive ICP framework to analyze the study data. He will be responsible for communicating with the NASA team on all study-related matters and participate in the results reporting and dissemination.

Research Pending:

Project Number: R01HL152679

Status on Grant: Principal Investigator

Approved Project Period: 4/1/2020 - 3/31/2024

% Effort: 15%

PI: Xiao Hu

Source: NIH

Annual Direct Costs: \$499,907 (total \$1,999.628)

Title of Project: Extremely Scaling up Training Data Size for Learning Accurate Ambulatory Atrial Fibrillation Detection

Project Goal: The goal of this project is to develop a large annotated database to train deep learning algorithm to achieve high accuracy in detecting atrial fibrillation using PPG signals.

Research: Past

Project Number: 1U01NS098961-01

Status on Grant: UCSF Subcontract PI

Approved Project Period: 9/30/2016 – 8/31/2019

% Effort: 5%

PI: Nader Pouratian, MD, PhD Source: NIH/NINDS

Annual Direct Costs:

Title of Project: Invasive Approach to Model Human Cortex-Basal Ganglia Action Regulating Network

Project Goal: This subcontract award to UCSF is to support Dr. Hu to develop novel signal processing methods for multichannel local field potentials and single-neuron recordings that will be recorded from neurosurgical patients undergoing invasive recordings of deep brain signals with the ultimate goal to obtain a deep understanding of action regulating network

Project Number: 1R01HL128679-01

Status on Grant: Principal Investigator

Approved Project Period: 7/15/2015 – 7/14/2019

% Effort: 15%

PI: Xiao Hu, PhD

Source: NIH/NHLBI

Annual Direct Costs: \$335,195 (total \$1,454,159)

Title of Project: Develop and validate SuperAlarm to Detect Patient Deterioration with Few False Alarms

Project Goal: Critical care patient monitoring remains unsatisfactory as evidenced by the alarm fatigue problem it has created. We propose to develop a data fusion framework to integrate monitor alarms, laboratory test results, and other non-monitored physiological variables to realize a more precise way of monitoring patients to provide early detection of patient crisis events with few false alarms. Our project will lead to a potentially transformative paradigm change of critical care patient monitoring towards a more integrated and precise system for recognizing crisis events and enabling early interventions and produce a database to the community to propel further development of predictive models.

Project Number: R01GM111378-01

Status on Grant: UCSF Subcontract PI

Approved Project Period: 8/1/2015 – 5/31/2019

% Effort: 4%

PI: Donatello Telesca, PhD

Source: NIH/NIGMS

Annual Direct Costs:

Title of Project: Unified Longitudinal Functional Data Framework for the Analysis of Complex Biomedical Data

Project Goal: This subcontract award to UCSF is to support Dr. Hu to provide biomedical signal processing domain expertise and use cases to PI Dr. Donatello at UCLA to develop a unified treatment of longitudinal functional data.

Project Number: 12113

Status on Grant: Investigator

Approved Project Period: 01/01/2014 – 12/31/2018

% Effort: 5%

PI: Chris Miaskowski, RN, PhD

Source: European Commission

Annual Direct Costs: \$ 74,380 (total \$371,900)

Title of Project: Prospective Observational Study of Ocular Health in ISS Crews (Ocular Health)

Project Goal: The goal of this project is to study symptom clusters from patient reported outcomes using wearable technologies after chemo treatment.

Project Number: R01 NS076738

Status on Grant: Principal Investigator

Approved Project Period: 5/15/2012 – 5/14/2016

% Effort: 15%

PI: Xiao Hu

Source: NIH/NINDS

Annual Direct Costs: \$342,165 direct/yr 1 (total \$1,368,660)

Title of Project: ICP Elevation Alerting Based on a Predictive Model Hosting Platform

Project Goal: The goal of this project is to develop a plug&play platform to support real-time analytics at the bedside and test an advanced ICP elevation alerting system based on this platform and advanced ICP elevation predictive models.

Project Number: R01 NS066008
 Status on Grant: Principal Investigator
 Approved Project Period: 5/15/2009 – 5/14/2013
 % Effort: 15%
 PI: Xiao Hu
 Source: NIH/NINDS
 Annual Direct Costs: \$218,750 direct/yr 1 (total \$875,000)
 Title of Project: Continuous-Signal Driven Predictive Models in Neurological Intensive Care Units
 Project Goal: The goal of this algorithm development project is to develop and validate a novel multi-classifier fusion paradigm for building models to predict acute ICP elevation and brain ventricle volume increase.

Project Number: R18 HS022860
 Status on Grant: UCSF subcontract PI
 Approved Project Period: 10/01/2014 - 9/30/2017
 % Effort: 9%
 PI: Leo Kobayashi, MD
 Source: AHRQ
 Annual Direct Costs: \$180,821 direct/yr 1 (Total \$552,687)
 Title of Project: Targeted Delivery of Multi-Parametric Telemetry Clinical Messages to Mitigate Alarm Fatigue
 Project Goal: The goal of this project is to develop and validate an open-architecture of data acquisition, innovative alarm algorithms, and target delivery of alarms in an emergency room at the LifeSpan medical center in Rhode Island. The UCSF subcontract is awarded to support Dr. Hu's UCSF team in developing intelligent alarms.

Project Number: NONE
 Status on Grant: Principal Investigator
 Approved Project Period: 6/1/2015 – 6/30/2016
 % Effort:
 PI: Xiao Hu
 Source: UCSF T1 Catalyst award
 Annual Direct Costs: \$40,000 direct/yr 1 (Total \$40,000)
 Title of Project: Superalarm: An Advanced Analytics Platform for Precise Patient Monitoring
 Project Goal: The goal is to develop a prototype user frontend for SuperAlarm software application.

Project Number: None.
 Status on Grant: Mentor and CO-I
 Approved Project Period: 7/01/2014 - 6/30/2015

% Effort: 2%

PI: Xiao Hu

Source: CTSI-Strategic Opportunities Support (SOS) Program

Annual Direct Costs: \$ 30,000 direct/yr 1 (Total \$30,000)

Title of Project: IMPEDANCE: Impedance Measurement in Patient Electrodes Affecting Noise in Clinical Electrocardiography

Project Goal: This study will investigate continuous impedance measurement of multiple ECG electrode for extended period of wearing and determine the association of signal quality changes with that of impedance changes.

Project Number: University Research Grant

Status on Grant: Principal Investigator

Approved Project Period: 4/01/2012 – 6/30/2012

% Effort: 5%

PI: Xiao Hu

Source: CHARLES STARK DRAPER LABORATORY, INC

Annual Direct Costs: \$75,000 (total 75,000)

Title of Project: Develop an Integrated Dynamic Visual Alarm System

Project Goal: The goal of this project is to develop a prototype web-based visualization of alarms from patient monitors.

Project Number: R01 NS054881

Status on Grant: Investigator

Approved Project Period: 2/15/2007 - 1/31/2011

% Effort: 10%

PI: Xiao Hu

Source: NIH/NINDS

Annual Direct Costs: \$225,312 direct/yr 1 (Total \$901,248)

Title of Project: In Vivo CSF Shunt Hydrodynamics in Hydrocephalus

Project Goal: The goal of this project is to study the hydrodynamics of normal pressure hydrocephalus using phase contrast MRI and intracranial pressure measurement.

Project Number: R21 NS059797

Status on Grant: Principal Investigator

Approved Project Period: 1/31/2008 - 1/30/2011

% Effort: 30%

PI: Xiao Hu

Source: NIH/NINDS

Annual Direct Costs: \$112,656 direct/yr 1- (Total \$225,312 total)

Title of Project: Intracranial Pressure Latency as a Biomarker of Cerebral Vasculature Status

Project Goal: The goal of this project is to test a novel approach of extracting biomarkers of pathological cerebral vasculature changes from analyzing intracranial pressure pulse latency to the heart beat.

Project Number: R21 NS055045

Status on Grant: Principal Investigator

Approved Project Period: 7/15/2007 - 12/31/2009

% Effort: 20%

PI: Xiao Hu

Source: NIH/NINDS

Annual Direct Costs: \$112,656 direct/yr 1 (Total \$225,312)

Title of Project: A Data Fusion Method for Bedside Monitoring of Lumped Cerebral Arterial Radii

Project Goal: The goal of this project was to develop and validate a mathematical model driven nonlinear Kalman filter to fuse multiple-streams of continuous physiological signals to extract hidden information of cerebral arterial radii.

Project Number: R21 NS055998

Status on Grant: Principal Investigator

Approved Project Period: 3/01/2007 - 2/28/2009

% Effort: 15%

PI: Xiao Hu

Source: NIH/NINDS

Annual Direct Costs: (\$112,656 direct/yr) 1 (Total \$225,312)

Title of Project: Data Mining Based Noninvasive Intracranial Pressure Assessment

Project Goal: The goal of this project was to test a novel integration of case-based reasoning and system identification approach to achieve noninvasive intracranial pressure assessment.

Project Number: UCLA Core Faculty Research Grant

Status on Grant: Principal Investigator

Approved Project Period: 7/01/2008 - 6/30/2009

% Effort: 5%

PI: Xiao Hu

Source: UCLA Academic Faculty Senate

Annual Direct Costs: \$10,000 direct/yr 1 (Total \$10,000)

Title of Project: Discover Association between Intracranial Pressure Pulse Morphology and Abnormalities in CT Brain Images of Head Injury Patients

Project Goal: The goal of the project is to investigate the association between ICP pulse morphological changes and CT brain abnormalities.

2. Educational/Training Support

None

Educational/Training: Present—Currently Active

Project Number:
Status on Grant
Approved Project Period:
% Effort:
PI:
Source:
Annual Direct Costs:
Title of Project:
Project Goal:

Educational/Training: Pending

Project Number:
Status on Grant:
Approved Project Period:
% Effort
PI:
Source:
Annual Direct Costs:
Title of Project:
Project Goal:

Educational/Training: Past

Project Number:
Status on Grant:
Approved Project Period:
% Effort:
PI:
Source:
Annual Direct Costs:
Title of Project:
Project Goal:

3. Other External Support

None

Other Support: Present—Currently Active

Project Number:

Status on Grant

Approved Project Period:

% Effort:

PI:

Source:

Annual Direct Costs:

Title of Project:

Project Goal:

Other Support: Pending

None

Other Support: Past

None

Clinical activity – Type of practice and estimate of time commitment:

None

Participation in academic and administrative activities:

UNIVERSITY SERVICE

UC SYSTEM AND MULTI-CAMPUS SERVICE

2016 - 2016	UCOP: Systemwide Faculty-Entrepreneur Focus Group	Invited Participant
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UCSF CAMPUSWIDE

2010 - 2013	UCLA Medical Center	Developed and Deployed AlarmX application for UCLA Medical Center that is in several ICUs for bed nurses to avoid missing critical alarms from monitors.
2013 - 2013	RAP Grant Proposal Review (Fall'2013)	Reviewer
2014 - 2014	Ad-hoc reviewer for Packard Fellow Candidate Selection	
2014 -	Committee on Research Technology	Committee Member

2014 - 2014	RAP Grant Proposal Review (Spring'2014)	Reviewer
2014 - 2014	Clinical Alarms Management Committee	Committee Member
2014 -	Resource Allocation Program (RAP) Digital Health Research Review Committee	Committee Member
2015 - 2016	UCSF-Samsung Digital Health Innovations Laboratory Clinical Advisory Board	Board Member
2015 -	Invited to Discuss Research during UC Regents's visit in January 2015	
2016 - 2017	Research Advisory Board	Committee Member
2015 -	UCSF Medical Center Clinical Alarms Management Committee	Committee Member
2017 -	Academic Senate Space Committee	Standing Member
2017 -	UCSF Space Committee	Standing Member
2018 -	UCST IT Governance Committee on Technology and Architecture	Standing Member
2018 -	UCSF Parnassus Height Master Planning Committee	Standing Member
2018 - 2019	UCSF Digital Hub Working Group	Member

SCHOOL OF MEDICINE

2017 -	Admission Committee for Masters In Transnational Medicine	Committee member
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SCHOOL OF NURSING

2013 - 2013	Co-hosting a Brown Bag Meeting to Discuss Stanford Medicine X meeting	Host
2014 - 2014	SON task force on quantitative methodology series renovation	Member
2014 -	SON Faculty Council	Member
2016 -	DPC Faculty Forum	Presenter

DEPARTMENTAL SERVICE

2005 - 2010	UCLA Department of Neurosurgery	Developed and maintain the Mortality and Morality Case Reporting/Presentation Web Portal for the Division of Neurosurgery
2008 - 2011	UCLA Department of Neurosurgery	Developed and maintain the Neurocritical Care Bundle Web Portal
2011 - 2011	UCLA Neurocritical Care Program	New faculty search committee member
2012 - 2013	UCLA Biomedical Engineering Graduate Program	Field Chair for BioSystems Science and Engineering
2012 - 2013	UCLA Bioengineering graduate admission committee	Committee member
2014 - 2014	Faculty Search Committee of Physiological Nursing	Committee Member
2014 - 2014	Faculty Search Committee of Family Health Care Nursing	Committee Member
2014 - 2014	Faculty Search Committee of Community Health	Committee Member
2014 - 2014	Junior Faculty Research Mentoring Committee of Physiological Nursing	Committee Member
2015 - 2016	Faculty Search Committees (3)	Committee Member

Administrative activities and/or committee assignments at institutions previous to Duke:
(if applicable; provide a separate list for each institution)

UCSF:

<u>Activities and/or Committee Assignments</u>		<u>Dates</u>
Resource Allocation Program (RAP) Digital Health Research Review Committee	Committee Member	2014 -
UCSF Medical Center Clinical Alarms Management Committee	Committee Member	2015 -
Academic Senate Space Committee	Standing Member	2017 -
UCSF Space Committee	Standing Member	2017 -
UCST IT Governance Committee on Technology and Architecture	Standing Member	2018 -

UCSF Parnassus Height Master Planning Committee Standing Member 2018 -

**Administrative activities and/or committee assignments at Duke:
(School of Nursing, Medical Center, and University)**

Duke University School of Nursing:

<u>Activities and/or Committee Assignments</u>	<u>Date(s)</u>
APT Committee	2020-
AI Health Workshop Planning Committee	2021
Racial Justice Committee - Faculty Recruitment & Hiring	2021

Duke University Medical Center:

<u>Activities and/or Committee Assignments</u>	<u>Date(s)</u>
Advisory board for Symphony project	2020
Advisory board for ICU Data mart project	2020

Duke University:

<u>Activities and/or Committee Assignments</u>	<u>Date(s)</u>
Climate and Data Science Working Group	2020
Woo Center Fellow Review and Selection Committee	2020

Date

Signature of Chair

Personal Information

Faculty member's preferred familiar name: Xiao Hu

Home address: 2 Pine Top Place, Durham, NC 27705

Home Phone # 310-498-6136