COREY WELLS ARNOLD

Curriculum Vitae

PERSONAL DATA

Biomedical Artificial Intelligence Research Lab (BAIR)
Department of Radiological Sciences
Department of Pathology & Laboratory Medicine
Department of Electrical & Computer Engineering
Department of Bioengineering
Department of Computational Medicine
924 Westwood Blvd
Los Angeles, CA 90024
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EDUCATION

2009	PhD	Information Science, University of California, Los Angeles
2005	MSc	Biomedical Engineering, University of California, Los Angeles
2002	BS	Biomedical Engineering/Computer Science, University of Wisconsin, Madison

PROFESSIONAL EXPERIENCE

2025-Present	Vice Chair of Research & Analytics, Department of Radiological Sciences, UCLA
2024-Present	Professor, Department of Computational Medicine, UCLA (joint)
2022-2025	Vice Chair of Research, Department of Radiological Sciences, UCLA
2021-Present	Field Chair, Biomedical Data Sciences, Department of Bioengineering, UCLA
2021-Present	Professor, Department of Electrical & Computer Engineering, UCLA (joint)
2021-Present	Professor, Bioinformatics Interdepartmental Program, UCLA (core faculty)
2021-Present	Professor, Department of Bioengineering, UCLA (joint)
2021-Present	Professor, Department of Pathology & Laboratory Medicine, UCLA (joint)
2021-Present	Professor, Department of Radiological Sciences, UCLA
2017-Present	Director, Biomedical Artificial Intelligence Research Lab (BAIR)
2020-2021	Associate Professor, Department of Electrical & Computer Engineering, UCLA (joint)
2019-2021	Associate Professor, Bioinformatics Interdepartmental Program, UCLA (core faculty)
2018-2021	Associate Professor, Department of Bioengineering, UCLA (joint)
2017-2021	Associate Professor, Department of Pathology & Laboratory Medicine, UCLA (joint)
2017-2021	Associate Professor, Department of Radiological Sciences, UCLA
2014-Present	Member, Institute for Quantitative and Computational Biology (QCBio), UCLA
2010-2018	Affiliate Faculty, Department of Bioengineering, UCLA School of Engineering
2010-2017	Assistant Professor, Department of Radiological Sciences, UCLA
2009-2011	Research Scientist, Department of Radiology, VA Greater Los Angeles Healthcare System
2009-2010	Assistant Professional Researcher, Department of Radiological Sciences, UCLA
2008	Research Intern, IBM Almaden Research Center, San Jose, CA
2006	Visiting Scholar, Lister Hill National Center for Biomedical Communications, National Institutes of Health
2003-2007	National Library of Medicine Fellow, UCLA NLM Medical Imaging & Informatics Training Program
2003	Programmer Analyst, Department of Biostatistics, Washington University in St. Louis
2000	Research Intern, Institute of Human Genetics, University of Minnesota, Twin Cities

PROFESSIONAL ACTIVITIES

Memberships

2024-Present	Member, International Society for Magnetic Resonance in Medicine (ISMRM)
2011-Present	Member, Association for Computing Machinery (ACM)

2007-Present Member, American Medical Informatics Association (AMIA)

Committees

2025 Internal Advisory Committee, T32 Neurotechnology Translation Training Grant – Faculty Mentor
2016 Program Committee, International Conference on Pattern Recognition Workshop on Pattern Recognition for Healthcare Analytics
2015-2018 Student Paper Competition Committee, American Medical Informatics Association Annual Symposium

Editorial Services

2023-Present Reviewer, The American Journal of Pathology
2023-Present Editor, Nature Scientific Reports
2023-Present Reviewer, Circulation
2022-Present Reviewer, Stroke
2022-Present Reviewer, Nature Medicine
2022-Present Reviewer, Nature Communications
2019-Present Reviewer, Journal of the National Cancer Institute
2018-Present Reviewer, Journal of Medical Systems
2018-Present Reviewer, Journal of the American Medical Informatics Association OPEN
2016-Present Reviewer, PLOS ONE
2016-Present Reviewer, Expert Systems with Applications
2015-Present Reviewer, Journal of Applied Clinical Informatics
2011-Present Reviewer, Journal of Biomedical Informatics
2010-Present Reviewer, Computers in Biology and Medicine
2008-Present Reviewer, Journal of the American Medical Informatics Association

Grant Review

2022 Health and Medical Research Fund from The Government of the Hong Kong Special Administrative Region (HKSAR), Reviewer
2022 NIH Study Section, Small Business: Disease Prevention and Management, Risk Reduction and Health Behavior change ZRG1 RPHB-Z(10), Reviewer
2019 Dutch Research Council Domain Applied and Engineering Sciences, Reviewer
2019 NIH Study Section, Urologic and Urogynecologic Applications ZRG1 DKUS-B (90), Reviewer
2019 Canada Foundation for Innovation Award internal review, University of British Columbia, Vancouver Canada, Reviewer
2019 NIH Study Section, Small Business: Disease Prevention and Management, Risk Reduction and Health Behavior change ZRG1 RPHB-Z (10) B, Reviewer
2018 NIH Study Section, Urologic P20 Applications ZDK1 GRB-M (O5), Reviewer
2017 NIH Study Section, Multi-scale Modeling Program ZEB1 OSR-C (J2) S, Reviewer
2017 NIH Study Section, Biomedical Computing and Health Informatics (BCHI), Reviewer
2016 NIH Study Section, Special emphasis panel ZRG1 HDM-Z (03) M, Reviewer
2014-Present UCLA Clinical and Translational Science Institute, Reviewer
2014 German Federal Ministry of Education and Research, Reviewer

AWARDS AND HONORS

2021 Outstanding Basic Science Faculty Teaching Award, Department of Radiological Sciences, UCLA
2017 American Medical Informatics Association Best Student Paper Award (Advisee Johnny Ho)
2013 Distinguished Poster Award, International Medical Informatics Association MEDINFO conference
2008-2009 UCLA Chancellor's Dissertation Year Fellow
2007-2008 UCLA Graduate Student Summer Research Mentorship
2007-2008 UCLA Regents Stipend

UCLA SERVICE

2024-2025 Faculty Senate Member, UCLA Academic Senate Legislative Assembly
2022-Present Member, UCLA Radiology Practice Group Executive Committee
2021-Present Co-chair, UCLA Radiology AI Working Group

2021-Present	Member, UCLA Radiology Committee on Academic Merits and Promotions (CAMP)
2018-2022	Member, UCLA Intercollegiate Athletics Committee
2017-2019	Member, UCLA Undergraduate Research Fellows Program Review Committee
2017-2019	Member, UCLA Undergraduate Research Scholarship Program Review Committee
2013-Present	Member, UCLA Clinical and Translational Science Institute Scientific Advisory Committee
2012	Member, UCLA Research Informatics Planning Committee (RISP)

PATENTS

1. Systems and Methods for Automated Image Analysis, U.S. Provisional Application Serial No. 62/402,075, filed on May 26, 2020.
2. Path R-CNN for Prostate Cancer Diagnosis and Gleason Grading of Histological Images, U.S. Provisional Application Serial No. 62/913,256 filed on October 10, 2019.
3. An Attention-based Multi-resolution Model for Prostate Whole Slide Image Classification and Localization, U.S. Provisional Application Serial No. 62/852,625, filed on May 24, 2019.
4. A Method of Computational Image Analysis for Predicting Tissue Infarction After Acute Ischemic Stroke, U.S. Provisional Application Serial No. 62/267,328 filed on December 15, 2016.
5. Apparatus and Method for Generating a Probability Map of a Biopsy Site, U.S. Provisional Application Serial No. 62/402,075, filed on September 30, 2016.
6. Automated Quality Control of Diagnostic Radiology, U.S. Provisional Application Serial No. 15/254,798 filed on September 1, 2016.
7. Systems and Methods for Analyzing Perfusion-Weighted Medical Imaging Using Deep Neural Networks, U.S. Provisional Application Serial No. 62/330,773 filed on May 2, 2016.

COURSES TAUGHT

2018-2019	HDS 200A: Health Analytics: Identifying, Collecting, and Analyzing Big Data in Healthcare, Cedars-Sinai (Guest Lecturer)
2013-2015	Clinical and Translational Science Institute Module 6: Seminar on Biomedical Informatics, UCLA K30 Training Program (Course Co-Director)
2013-2017	Health Policy and Management 441: Health Analytics: Identifying, Collecting, and Analyzing Big Data in Healthcare, UCLA (Guest Lecturer)
2009-Present	Bioengineering 220: Introduction to Biomedical Informatics, UCLA (Guest Lecturer)
2009-Present	Bioengineering 223: Programming Lab for Informatics, UCLA (Course Director)
2009-Present	Bioengineering 224B: Advances in Imaging Informatics, UCLA (Course Co-Director)

RESEARCH GRANTS

Title	**Computational Feature Profiling and Modeling for Prostate Cancer Detection and Risk Stratification (R01 CA279666)**
Dates	December 1, 2023 – November 20, 2028
Source/Institution	NIH/NCI, National Cancer Institute
Principal Investigator	Corey Arnold, PhD
Direct Costs	$2,450,000
Role(s)	PI

Prostate cancer is a leading cause of cancer death in American men, but up to 60% of patients who receive treatment may not require it as they would eventually succumb to a different health problem. The focus of this research is to investigate new methods for more accurately detecting cancer and assessing its aggression using medical imaging data, histology data, genetic data, and other risk factors towards reducing overdiagnosis and overtreatment, thus preventing patients from receiving unnecessary treatment and incurring associated negative functional outcomes.

Title	**Identification of Men at High-Risk of Metastatic Disease after Neoadjuvant Intensive Androgen Signaling Inhibition**
Dates	September 1, 2023 – August 31, 2025
Source/Institution	Prostate Cancer Foundation 2023 Challenge Award

Principal Investigator	Mary-Ellen Taplin, MD
Direct Costs	$100,000
Role(s)	Site PI

Our major hypothesis is that comprehensive assessment of the residual tumor in the radical prostatectomy specimen after neoadjuvant therapy will provide biomarkers that reflect intrinsic genomic or epigenomic features of the residual tumor and/or the response in the microenvironment. Our translational research plan is to have a paradigm shift in the treatment of men with high-risk localized prostate cancer. Specifically, these men would be enrolled in neoadjuvant trials of intensive androgen signaling inhibition, and analysis of the radical prostatectomy specimen would be used to determine who should go on to clinical trials of precision adjuvant therapy, which would be based on features of the residual tumor.

Title	**Dynamic Graph-based Positive-Unlabeled Learning Framework for Modeling Electronic Health Records (20231808)**
Dates	February 24, 2023 – February 23, 2025
Source/Institution	Optum Labs
Principal Investigator	Corey Arnold, PhD
Direct Costs	$400,000
Role(s)	PI

In this project, we propose to reconstruct sequential EHR data as dynamic graphs to capture the temporal evolution of high-order connected patient-item interactions in an integrative context. Specifically, we argue that dynamic graph convolutional networks are appropriate basis models for learning hidden EHR structure, and we propose time-aware information propagation and aggregation methods to explore the influence of data points with different timestamps on future patient status. The proposed model will serve as a general-purpose representation learning technique for EHR data analysis, including diagnosis prediction, prescription recommendation, patient clustering, and the handling of missing data.

Title	**Hypothalamic Amenorrhea as a Fertility Status Marker for Cardiovascular Health (R01 HD106096)**
Dates	September 1, 2021 – July 31, 2025
Source/Institution	NIH/NICHD, Eunice Kennedy Shriver National Institute of Child Health & Human Development
Principal Investigator	Chrisandra Shufelt, MD
Direct Costs	$151,000
Role(s)	Site PI

Hypothalamic amenorrhea (HA) occurs during reproductive years and results in ovulatory dysfunction, anovulation and infertility which can be prolonged from months to years and is characterized by varying combinations of psychosocial stress, anxiety, high levels of physical activity and/or weight loss. Data from our group indicates that one-third of women with HA have preclinical CVD measured noninvasively as vascular dysfunction and vascular inflammation. Our application will study HA as a marker of fertility status for cardiovascular health and perform dense-phenotyping using remote patient monitoring and patient reported outcomes to determine which HA phenotype are related to preclinical CVD and inflammation and expand our analyses to a large population cohort with 30-year CVD risk factors and CVD event follow-up.

Title	**Predicting the Presence of Clinically Significant Thyroid Cancer using Ultrasound Imaging (R21 EB030691)**
Dates	June 4, 2021 – March 31, 2024
Source/Institution	NIH/NIBIB, National Institute of Biomedical Imaging and Bioengineering
Principal Investigator	William Speier, PhD
Direct Costs	$400,000
Role(s)	Investigator

Medical image analysis plays an important role in computer aided detection and diagnosis, but usually focuses on individual images in isolation. Graph convolutional networks have the ability to utilize the relationships be- tween images in a study to aggregate information and make a more accurate evaluation. The focus of this project is to implement a graph-based approach for distinguishing indolent from aggressive thyroid cancer, thus preventing patients from receiving unnecessary treatment and incurring associated negative functional outcomes.

Title	**mHealth for Heart Failure: Predictive Models of Readmission Risk and Self-care Using Consumer Activity Trackers (R01 HL141773)**
Dates	April 5, 2019 – February 28, 2024
Source/Institution	NIH/NHLBI, National Heart, Lung, and Blood Institute
Principal Investigator	Corey Arnold, PhD
Direct Costs	$1,911,676

Heart failure (HF) is a debilitating disease that affects over five million people in the United States and in 2012 had a direct cost of over $30.7 billion annually. Home monitoring of HF patients has the potential to reduce costs and improve quality of life by reducing preventable hospital readmissions. The goals of this R01 are to: 1) demonstrate that patients are adherent to a home monitoring regimen when using minimally-invasive monitoring technologies; 2) combine the minimally-invasive home monitoring regimen with predictive algorithms to forecast hospital readmission; 3) develop models using electronic health record (EHR) data and a baseline survey to predict levels of adherence to the home monitoring regimen; and 4) explore the pragmatic feasibility of using a mobile app for communicating with patients in prospective pilot study.

Title	**Predicting the Presence of Clinically Significant Prostate Cancer using Multiparametric MRI and MR-US Fusion Biopsy (R21 CA220352)**
Dates	June 1, 2018 – May 31, 2021
Source/Institution	NIH/NCI, National Cancer Institute
Principal Investigator	Corey Arnold, PhD
Direct Costs	$275,000
Role(s)	PI

The research objective of this R21 is to develop novel techniques using multiparametric magnetic resonance imaging (mp-MRI) and MRI-ultrasound (US) fusion guided biopsy data that provide discriminatory power in distinguishing indolent versus clinically significant prostatic adenocarcinoma based on non-invasive imaging. We propose to implement deep learning models for clinical prostate mp-MRI sequences to generate new quantitative imaging features representative underlying tissue. Our models will accommodate ground truth labels from pathology whole mount specimens, as well as MRI-US fusion biopsy results. Model features will be used to predict voxel-level cancer suspicion, thereby enabling a novel method for performing “imaging biopsies.” Finally, voxel-level suspicion maps will be aggregated into patient-level quantitative imaging biomarkers and combined with clinical data to create a multimodal nomogram for performing risk stratification.

Title	**A Machine Learning Approach to Classifying Time Since Stroke using Medical Imaging (R01 NS100806)**
Dates	May 1, 2018 – February 28, 2024
Source/Institution	NIH/NINDS, National Institute of Neurological Disorders and Stroke
Principal Investigator	Corey Arnold, PhD
Direct Costs	$1,943,542
Role(s)	PI

Stroke is a leading cause of death in the United States, with approximately 795,000 Americans experiencing a new or recurrent stroke each year. However, patients who present with an unknown stroke onset time are ineligible for receiving the leading therapy. The focus of this research is to develop a novel machine learning method for classifying stroke onset time from imaging, enabling treatment for a new cohort of patients and potentially saving them from severe morbidity or mortality.

Title	**Machine Learning Tools to Diagnose Prostate Cancer in Multi-parametric MR and Whole Slide Imaging (P50 CA092131)**
Dates	September 1, 2017 – August 31, 2019
Source/Institution	NIH/NCI, National Cancer Institute
Principal Investigator	Robert Reiter, MD
Direct Costs	$50,000
Role(s)	PI (Institutional sub-award)

The research objective of this project is to develop novel machine learning techniques to more accurately diagnose prostate cancer using multiparametric magnetic resonance imaging (mp-MRI) data, MRI-ultrasound (US) fusion guided biopsy data, and whole slide imaging (WSI) pathology data. We propose to implement a multi-instance learning (MIL) based convolutional neural network (CNN) model for clinical prostate mp-MRI sequences to generate new quantitative imaging features

representative of the underlying tissue. Hierarchical CNN features will be used to predict voxel-level Gleason scores, thereby enabling a novel method for performing "imaging biopsy," with the ultimate goal of providing discriminatory power in distinguishing indolent versus clinically significant prostatic adenocarcinoma based on non-invasive imaging. We will similarly develop deep learning image analysis tools for prostate cancer WSI that enable the repeatable quantification of cancer heterogeneity from histopathology. These tools may assist pathologists in cancer detection and reporting. Ultimately, the combination of discovered imaging and pathology features will allow for a more precise diagnosis of prostate cancer, which in further studies may be correlated with prognosis, treatment response, and outcome.

Title	**mHealth for Heart Failure: Predictive Models of Readmission Risk and Self-care Using Consumer Activity Trackers (R56 HL135425)**
Dates	September 1, 2017 – August 31, 2019
Source/Institution	NIH/NHLBI, National Heart, Lung, and Blood Institute
Principal Investigator	Corey Arnold, PhD
Direct Costs	$394,966
Role(s)	PI

Heart failure (HF) is a debilitating disease that affects over five million people in the United States and in 2012 had a direct cost of over $30.7 billion annually. Home monitoring of HF patients has the potential to reduce costs and improve quality of life by reducing preventable hospital readmissions. The goal of this one-year R56 pilot study of 25 subjects is to demonstrate that patients are adherent with home monitoring regimens when using minimally invasive monitoring technologies, and that a minimally-invasive home monitoring regimen combined with novel predictive algorithms may be used to forecast hospital readmission.

Title	**Remote Monitoring to Predict Heart Failure**
Dates	November 1, 2016 – August 31, 2018
Source/Institution	California Institute to Advance Precision Medicine
Principal Investigator	Brennan Spiegel, MD
Direct Costs	$1,200,000
Role(s)	Investigator

This project will look for the earliest signs of cardiovascular disease by monitoring patients remotely with a consumer fitness tracker that measures activity, sleep, heart rate and stress level. Participants in the study also will report their levels of anxiety, depression and quality of life using a smartphone or computer. Additionally, patients will send researchers finger-prick blood samples by mail, allowing doctors to assess a variety of biomarkers and measure more than 500 blood proteins.

Title	**UCLA Clinical and Translational Science Institute (UL1 TR001881; TL1 TR001883)**
Dates	September 1, 2016 – August 31, 2021
Source/Institution	NIH/NCATS, National Center for Advancing Translational Sciences
Principal Investigator	Steven Dubinett, MD
Direct Costs	$69,600,000
Role(s)	Investigator

In the continuance of UCLA's Clinical Translational Science Award (CTSA), efforts continue to further develop advanced infrastructure for translational. Its mission is to bring biomedical innovations to bear on the greatest health needs of Los Angeles – the largest and one of the most ethnically, socially and economically diverse counties in the United States. The CTSI has five aims: 1) prepare the translational workforce to conduct high-quality, multidisciplinary team science; 2) engage stakeholder communities in clinical and translational research and disseminate successful models of collaboration; 3) integrate special populations, especially those experiencing health disparities, into research; 4) improve methods and processes to accelerate scientific translation, overcome key roadblocks and support multisite research; and 5) provide informatics solutions to operational and scientific roadblocks to advance high-impact translational science within the UCLA CTSI and the CTSA network.

Title	**The Los Angeles PRISMS Center: The Biomedical Real-Time Health Evaluation (BREATHE) Platform (U54 EB022002)**
Dates	September 30, 2015 – June 30, 2021

Source/Institution	NIH/NIBIB, National Institute of Biomedical Imaging and Bioengineering
Principal Investigator	Alex Bui, PhD
Direct Costs	$4,719,671
Role(s)	Investigator

The Los Angeles (LA) PRISMS Center aims to be the leader in the development and application of mobile health (mHealth) technologies that deepen our scientific understanding and clinical management of pediatric conditions. Bringing together leading experts from UCLA and USC in biomedical informatics, computer science, wireless health, environmental science and health, and pediatrics, this Center proposes creation of an innovative end-to-end software infrastructure for pediatric sensor-based health monitoring.

Title	**Social Media and Direct Patient Reporting in Healthcare: A Tool to Detect, Monitor, and Improve the Illness Experience**
Dates	February 15, 2015 – February 14, 2016
Source/Institution	Shire Pharmaceuticals
Principal Investigator	Corey Arnold, PhD/Brennan Spiegel, MD
Direct Costs	$67,758
Role(s)	Co-PI

In this study, we propose to employ novel techniques to learn new information from patients with IBD using social media and electronic portals (e-portals). In Part I of this study, we will use techniques developed at UCLA that allow us to methodically scan the Internet and Twitter feeds to identify and listen into open, publically accessible patient conversations about IBD. In Part II, we will pilot test an innovative approach to communicating with IBD patients via an e-portal, using a mobile application feature called My QOL that is built into an existing mobile application called My GI Health.

Title	**Using readily accessible social-media data to develop and test cost-effective, scalable virtual pragmatic trials**
Dates	October 15, 2014 – June 14, 2016
Source/Institution	Robert Wood Johnson Foundation
Principal Investigator	Corey Arnold, PhD/Brennan Spiegel, MD
Direct Costs	$210,775
Role(s)	Co-PI

This project will develop and validate a social-media-based patient-reported outcome (PRO) to estimate health-related quality of life (HRQOL). The development of a reliable and validated social-media-based PRO could ultimately help caregivers understand the comparative effectiveness of the therapies prescribed to their patients in a significantly more cost-effective and timely manner.

Title	**A Topic Model and Visualization for Automatic Summarization of Patient Records (R21 LM011937)**
Dates	September 1, 2014 – August 31, 2017
Source/Institution	NIH/NLM, National Library of Medicine
Principal Investigator	Corey Arnold, PhD
Direct Costs	$275,000
Role(s)	PI

The focus of this research proposal is the development of an automatic summarization system to expedite the review of a patient's medical history. Two specific aims guide the proposed work: 1) to create a topic model of free-text clinical documents that integrates contextual patient- and document-level data, and discovers multi-word concepts; and 2) to utilize the proposed model to drive a web application that includes concept-, source-, and time-oriented views for automatically summarizing patient records.

Title	**Adapting the Hope Social Media Intervention to Reduce Prescription Drug Abuse (R21 DA039458)**
Dates	September 1, 2014 – August 31, 2017
Source/Institution	NIH/NIDA, National Institute on Drug Abuse
Principal Investigator	Sean Young, PhD

Direct Costs	$275,000
Role(s)	Investigator

This proposal seeks to determine the feasibility, acceptability, and preliminary effectiveness of applying the Harnessing Online Peer Education (HOPE) intervention, or peer support social media community model, to reduce prescription drug abuse among chronic opioid non-cancer pain patients. The HOPE intervention is an evidenced-based peer-led social media intervention provided over Facebook that has been successfully used to change health behaviors.

Title	**Is MyPlate.gov approach to helping overweight patients lose weight more patient-centered? (1306-01150)**
Dates	March 1, 2014 – February 28, 2017
Source/Institution	Patient Centered Outcomes Research Initiative (PCORI)
Principal Investigator	William McCarthy, PhD/Lillian Gelberg, MD
Direct Costs	$1,500,000
Role(s)	Investigator

This study proposes a randomized controlled trial comparing the patient-centeredness and efficacy of two government-recommended behavioral strategies for losing excess weight (MyPlate and Calorie Counting). The study utilizes tablet-based software to self-administer questionnaires in community clinics. Results are transmitted to a remote server over a WI-FI or cellular data connection, where they are aggregated and analyzed.

Title	**Harnessing Social Media to Understand the Opioid Induced Constipation Experience**
Dates	March 1, 2014 – August 31, 2014
Source/Institution	Takeda Pharmaceuticals
Principal Investigator	Corey Arnold, PhD/Brennan Spiegel, MD
Direct Costs	$72,313
Role(s)	Co-PI

This study proposes to learn new information from patients with opioid induced constipation (OIC) using social media and online patient e-forums. Using natural language processing (NLP) techniques developed at UCLA, Internet message boards and Twitter feeds will be monitored to identify and listen into patient conversations about OIC. This will provide unprecedented access into the lives of patients suffering with OIC, enabling new insights into patient perspectives, and creating a conceptual framework governing the OIC biopsychosocial illness experience.

Title	**Medical Imaging Informatics Training Grant (T32 EB016640)**
Dates	September 1, 2013 – August 31, 2023
Source/Institution	NIH/NIBIB, National Institute of Biomedical Imaging and Bioengineering
Principal Investigator	Alex Bui, PhD
Direct Costs	$830,825
Role(s)	Investigator

This T32 training grant continues the imaging informatics graduate student program that originated with a T15 from the National Library of Medicine. With the now ubiquitous usage of imaging as an in vivo method for objectively documenting and elucidating disease and the human condition, novel research challenges arise in the acquisition, the understanding, and the usage of imaging and related (clinical) data to realize new knowledge and improved health outcomes.

Title	**A Predictive Prognostic Model for Glioblastoma Multiforme (R01 CA1575533)**
Dates	June 1, 2012 – May 31, 2018
Source/Institution	NIH/NCI, National Cancer Institute
Principal Investigator	Alex Bui, PhD
Direct Costs	$7,753,684
Role(s)	Investigator

This research effort looks to validate a Bayesian belief network (BBN) developed using two NIH datasets: the National Cancer Institute (NCI) Rembrandt Project; and the Cancer Genome Atlas (TCGA). Model variables will encompass the full spectrum of available observations (demographics, initial presentation, histopathology, treatment, imaging, performance scores, end outcomes, etc.).

Title	**RUMI: A Patient Portal for Retrieving Understandable Medical Information (R01 LM011333; Advanced Informatics for Health)**
Dates	June 1, 2012 – May 31, 2017
Source/Institution	NIH/NLM, National Library of Medicine
Principal Investigator	Alex Bui, PhD
Direct Costs	$1,000,000
Role(s)	Investigator

The objective of this proposal is the development of a framework, named RUMI (Retrieving Understandable Medical Information), which challenges how cancer patients receive information today by making the process of care explicit to the patient, providing access to his/her medical record data in the direct context of a clinical guideline so they can see how decisions are made.

Title	**An Observational Acute Stroke Model for Decision Support and Comparing Outcomes (R01 NS076534)**
Dates	September 1, 2011 – August 31, 2017
Source/Institution	NIH/NINDS, National Institute of Neurological Disorders and Stroke
Principal Investigator	Alex Bui, PhD/Gary Duckwiler, MD
Direct Costs	$1,789,952
Role(s)	Investigator

This proposal focuses on the creation of an observational database that is subsequently used to support an influence diagram for acute stroke treatment. The database is predicated on the specification of a unified information model for stroke and its treatment.

Title	**UCLA Clinical and Translational Science Institute**
Dates	June 1, 2011 – February 29, 2016
Source/Institution	NIH/NCATS, National Center for Advancing Translational Sciences
Principal Investigator	Steven Dubinett, MD
Role(s)	Investigator, Biomedical Informatics Program

The mission of the UCLA Clinical and Translational Science is to bring UCLA innovations to bear on the greatest health needs of Los Angeles and the nation. The Biomedical Informatics Program (BIP) is a critical dimension of the CTSI enterprise focused on the informatics of Researchers, Subjects, and Data. The overarching goal is to organize each of these domains so that finding, accessing, and (re)using valuable human and information resources is not only possible but efficient.

Title	**Statistical Models for Translating Medical Narrative to Patient Information Resources**
Dates	June 1, 2011 – February 2, 2012
Source/Institution	UCLA Radiology Exploratory Research Program
Principal Investigator	Corey Arnold, PhD
Direct Costs	$7,322
Role(s)	PI

The objective of this exploratory proposal is the development of a statistical latent topic model for structuring a patient's medical record into semantically meaningful components that may be mapped to patient-oriented information resources, enabling new use cases for patient portals.

Title	**Toward Individually-tailored Medicine: Probabilistic Models of Cerebral Aneurysms (R01 EB00362)**
Dates	October 1, 2009 – September 30, 2013
Source/Institution	NIH/NIBIB, National Institute of Biomedical Imaging and Bioengineering
Principal Investigator	Alex Bui, PhD/Fernando Vinuela, MD
Direct Costs	$1,579,600

Role(s) Research Scientist

The objective of this work is the creation of an informatics infrastructure to help elucidate the genesis, progression, and treatment of intracranial aneurysms.

Title **Data Structuring and Visualization System for Neuro-Oncology (R01 LM009961)**
Dates July 1, 2009 – June 30, 2013
Source/Institution NIH/NLM, National Library of Medicine
Principal Investigator Ricky Taira, PhD
Direct Costs $1,906,907
Role(s) Research Scientist

This proposal addresses the development of a system for facilitating the review of clinical patient data intended to promote an orderly process of medical problem understanding and care. Phenomenological models of disease will be used with natural language processing (NLP) to abstract information from medical reports.

Title **An Imaging-based Disease Model for Understanding Bone Health (R01 EB009306)**
Dates September 1, 2008 – August 31, 2013
Source/Institution NIH/NIBIB, National Institute of Biomedical Imaging and Bioengineering
Principal Investigator Hooshang Kangarloo, MD
Direct Costs $1,861,990
Role(s) Research Scientist

This project addresses the development of a disease model for bone development to better comprehend the genesis of osteoporosis.

Title **Imaging-based Medical Informatics Training Grant (T15 LM07536)**
Dates July 1, 2007 – June 30, 2013
Source/Institution NIH/NLM, National Library of Medicine
Principal Investigator Alex Bui, PhD
Direct Costs $2,987,662
Role(s) Instructor, student mentor, program developer

The objective of this grant is to support training of the upcoming generation of scientists in medical imaging informatics. The next significant challenge in biomedical informatics will be to support new knowledge discovery: thus, the application domain of this training program will be on informatics in support of clinical and translational research.

LECTURES AND SCIENTIFIC PRESENTATIONS

1. **Arnold CW**. Topic Modeling and its Applications in Biomedical Data. Research Seminar Series, UCLA Institute for Quantitative and Computational Biosciences, Los Angeles, CA; July 24, 2015.
2. **Arnold CW**. Probabilistic Topic Modeling with Clinical Data. UCLA Clinical Translational Science Institute (CTSI) and Institute for Digital Research and Education (IDRE) Program: Unlocking Patient Data for Novel Research Collaboration, Los Angeles, CA; June 2, 2014.
3. **Arnold CW**. Practical Tools in Biomedical Informatics: Introduction to Natural Language Processing and Machine Learning. UCLA Clinical Translational Science Institute (CTSI) Workshop on Biomedical Informatics, Los Angeles, CA; May 27, 2014.
4. **Arnold CW**. Probabilistic Topic Modeling with Clinical Data. UCLA Workshop on Big Data to Knowledge (BD2K), Los Angeles, CA; March 27, 2014.
5. **Arnold CW**. Probabilistic Topic Modeling with Biomedical Data. BE 299: Seminar Series. UCLA Department of Bioengineering, Los Angeles, CA; January 30, 2014.
6. **Arnold CW** and Oh A. RadPath: Integrating Imaging and Pathology Diagnoses in Lung Cancer. Faculty Research Seminar. UCLA Radiological Sciences, Los Angeles, CA; Nov 6, 2013.
7. **Arnold CW**. Probabilistic Topic Modeling with Biomedical Data. Charles R. Drew University of Medicine and Science Cross-Disciplinary Lecture Series, Los Angeles, CA; Sept 18, 2013.
8. **Arnold CW**. Practical Tools in Biomedical Informatics: Introduction to Natural Language Processing and Machine Learning. UCLA Clinical Translational Science Institute (CTSI) Workshop on Biomedical Informatics, Los Angeles, CA; May 23, 2013.
9. **Arnold CW** and Hsu W. Biomedical informatics research: implications in healthcare. UCLA Seminar for visiting MBA

students of Hochschule Neu-Ulm (HNU), Los Angeles, CA; June 2010.
10. **Arnold CW** and Davis M. Medical report driven literature retrieval to support evidence-based medicine. IBM Almaden Research Center, San Jose, CA; Aug 2008.
11. **Arnold CW**. Exploring medical reports using topic models. Annual National Library of Medicine Trainee Meeting, Washington DC; June 2008.
12. **Arnold CW**, Corso J, Bui AAT. An Unsupervised Approach to Automatic Image Annotation. NSF Biomedical Informatics Workshop: Expanding Secondary Use of Health Data, Portland, OR; December 2007.

Invited Talks

1. Invited Speaker. *Applications of AI in Healthcare: from the EHR to Imaging.* Mass General Brigham AI Grand Rounds Lecture Series (Artificial Intelligence for Clinicians (AI4C)). Virtual; October 9, 2025.
2. Invited Speaker. *Optimizing Cancer Registry Abstraction with AI*. Becker's Health IT Conference. Chicago, IL; October 2, 2025.
3. Invited Speaker. *Foundation Models in Digital Pathology*. UCLA Health Data Day 2025. Los Angeles, CA; May 28, 2025.
4. Invited Speaker. *Multimodal AI Data Fusion in Cancer*. EDRN Scientific Workshop. Gaithersburg, MD; May 20-24, 2025.
5. Invited Speaker. *Applications of AI in Healthcare*. UCLA-Kyoto University-Academia Sinica, Pan Pacific Meeting. Los Angeles, CA; May 14-16, 2025.
6. Invited Speaker. *Applications of AI in Healthcare: from the EHR to Imaging*. UCLA Computational Medicine Seminar Series. Los Angeles, CA; February 12, 2025.
7. Invited Speaker. *Applications of AI in Healthcare: from the EHR to Imaging.* Musculoskeletal Seminar. University of California, Los Angeles; January 22, 2025.
8. Invited Speaker. *Applications of AI in Healthcare: from the EHR to Imaging.* UCLA CTSI Biomedical AI Conference. Los Angeles, CA; December 4, 2024.
9. Invited Speaker. *AI in Radiology.* UCLA Health AI Council Meeting. Virtual; September 4, 2024.
10. Invited Interviewee. *UCLA doctors leading charge for use of AI technology to treat, diagnose and predict cancer.* CBS News. Los Angeles, CA; June 3, 2024.
11. Invited speaker. *Multi-modal Medical Image Analysis in Prostate Cancer.* 10th Annual Digital Pathology & AI Conference: USA; San Diego, CA; May 7, 2024.
12. Invited speaker. *RadPath Diagnosis of Prostate Cancer using AI Methods.* Stand Up 2 Cancer SU2C Innovation Summit: AI in Cancer Research, Diagnosis, and Treatment. Mountain View, CA; May 3, 2024.
13. Invited speaker. *AI Image Synthesis in Brain and Lung.* Siemens Healthineers Research Seminar. Siemens Healthineers, Erlangen Germany; September 12, 2023.
14. Panel moderator. *The Next Generation of Rad-Path, Facilitated by AI.* American College of Radiology 2022 Imaging Informatics Summit. Washington DC; October 22, 2022.
15. Invited speaker. *A UC Radiology Federated Learning Consortium.* UC AI in Radiology Annual Meeting. University of California, San Diego; October 6, 2022.
16. Invited speaker. *Developing AI for Clinical Applications.* Hood College and Frederick National Laboratory for Cancer Research, AI in Cancer Research and Clinical Care: Turning Promise into Reality Symposium. Frederick, MD; September 20, 2022.
17. Invited speaker. *Deep Learning Applications in Prostate Cancer and Acute Stroke Imaging.* Siemens Healthineers Research Seminar. Siemens Healthineers, Erlangen Germany; September 6, 2022.
18. Invited speaker. *Computational Disease Phenotyping using Machine Learning.* P30 Building and Innovating: Digital Health Technology and Analytics Center Talk. Division of Clinical Immunology and Rheumatology, University of Alabama, Birmingham. September 10, 2021.
19. Invited speaker. *Computational Image Phenotyping for Stroke and Prostate Cancer.* Berkeley Institute for Data Science ImageXD – Images Across Domains Annual Meeting. May 18, 2021.
20. Invited speaker. *Computational Disease Phenotyping using Machine Learning.* Radiology Grand Rounds. Department of Radiology, University of Wisconsin, Madison. April 1, 2021.
21. Invited speaker. *Integrating Pathology with Radiology: Discovering Unexpected Opportunities.* Clinical Informatics Grand Rounds. Texas Children's Hospital. September 16, 2020.
22. Invited speaker. *Learning Predictive Computational Phenotypes from Medical Images.* Southern California Biomedical Imaging and Machine Learning Symposium. University of California, Irvine; October 4, 2019.
23. Invited speaker. *Diagnosing Prostate Cancer in Radiology and Digital Histology Imaging using Machine Learning.* Siemens Healthineers Research Seminar. Siemens Healthineers, Erlangen Germany; September 10, 2019.
24. Invited speaker. *Classifying Prostate Cancer from Multiparametric Magnetic Resonance Imaging and Whole Slide Histology Imaging using Machine Learning.* NIH National Cancer Institute Informatics Technology for Cancer Research Annual Meeting, Park City, Utah; May 30, 2019.

25. Invited speaker. *Stroke Tissue Fate Prediction and Onset Time Classification using Machine Learning.* Siemens Healthineers Research Seminar. Siemens Healthineers, Erlangen Germany; September 4, 2018.
26. Invited speaker. *Artificial Intelligence and Prostate MRI: The Future.* MRI, Targeted Biopsy, Intervention and Biomarkers in Prostate Cancer Management. Office of Continuing Medical Education, UCLA. Los Angeles, CA; February 17, 2018.
27. Invited speaker. *Applications of Deep Learning in Radiology and Pathology with Integrated Reporting.* HeartBD2K Technical Conference. International WebEx; February 2, 2018.
28. Invited speaker. *UCLA IDxP: Integrated Diagnostic Platform.* Siemens Healthineers Research Seminar. Siemens Healthineers, Erlangen Germany; September 11, 2017.
29. Invited speaker. *Predictive Computational Phenotyping of Clinical Images and Text using Machine Learning.* General Medical Sciences Faculty Seminar. Washington University in St. Louis. St. Louis, MO; June 12, 2017.
30. Invited speaker. *Discovering Themes and Quantifying Clinical Narrative using Topic Models.* HeartBD2K Technical Conference. International WebEx; June 2, 2017.
31. Invited speaker. *Estimating Perfusion Parameters in Stroke using Deep Learning.* 14th Annual World Congress of the Society for Brain Mapping and Therapeutics, Los Angeles, CA; April 18, 2017.
32. Invited speaker. *UCLA Integrated Diagnostic Report.* Sectra Medical Systems. Linköping, Sweden; October 4, 2016.
33. Invited speaker. *Exploring Unstructured Biomedical Data with Topic Models.* Health Informatics Professional Interest Community (HIPIC) Seminar. T.J. Watson Research Center, IBM, Yorktown Heights, NY; May 19, 2016.
34. Invited speaker. *Discovering Hidden Themes in Unstructured Biomedical Data.* Health Services Research Seminar Series. Cedars-Sinai Hospital, Los Angeles, CA; April 28, 2015.
35. Invited panelist. *Radiologic-Pathologic Correlation: Challenges and Opportunities.* Linking Biomedical and Clinical Data. American Medical Informatics Association Annual Pre-Symposium, San Francisco, CA; Nov 14, 2015.
36. Invited speaker. *Discordance and Integrated Reporting in Lung Cancer Diagnosis.* Department of Radiology Research Seminar, Massachusetts General Hospital, Boston, MA; June 2, 2015.
37. Invited speaker. *How UCLA's Pioneering Integration of Radiology and Pathology Services Delivers More Diagnostic Value to Physicians and Patients.* Executive War College Conference on Laboratory & Pathology Management, New Orleans, LA; May 5, 2015.
38. Invited speaker. *Graduate Research in Biomedical Informatics.* UCLA Academic Advancement Program (AAP). Los Angeles, CA; May 2009.

PUBLICATIONS/BIBLIOGRAPHY

Research Papers: Peer Reviewed

1. Redekop E*, Wang Z*, Kulkarni R, Pleasure M*, Chin A, Hassanzadeh H, Hill B, Emami M, Speier W, **Arnold CW**. Zero-shot medical event prediction using a generative pretrained transformer on electronic health records. Journal of the American Medical Informatics Association, ocaf160, 2025.
2. Athreya S, Melehy A, Sunthanhar SSA, Ivezic V, Radhachandran A, Sant V, **Arnold CW**, Speier W. Combining Ultrasound Imaging and Molecular Testing in a Multimodal Deep Learning Model for Risk Stratification of Indeterminate Thyroid Nodules. Thyroid 35(5):590-594, 2025.
3. Redekop E*, Pleasure M*, Wang Z*, Sisk A, Zong Y, Flores K, Speier W, **Arnold CW**. Generating 2.5 D pathology for enhanced viewing and AI diagnosis. Journal of Pathology Informatics. 2025.
4. Ivezic V, Radhachandran A, Redekop E*, Athreya S, Lee D, Sant V, **Arnold CW**, Speier W. CytoFM: The first cytology foundation model. Proceedings of the Computer Vision and Pattern Recognition Conference Workshop Paper. 4749-4757, 2025.
5. Redekop E*, Pleasure M*, Ivezic V, Wang Z, Flores K, Sisk A, Speier W, **Arnold CW**, Prototype-Guided Diffusion for Digital Pathology: Achieving Foundation Model Performance with Minimal Clinical Data. Proceedings of the Computer Vision and Pattern Recognition Conference Workshop Paper. 5187-5195, 2025.
6. Avram O, Durmus B, Rakocz N, Corradetti G, An U, Nittala MG, Terway P, Rudas A, Chen ZJ, Wakatsuki Y, Hirabayashi K, Velaga S, Tiosano L, Corvi F, Verma A, Karamat A, Lindenberg S, Oncel D, Almidani L, Hull V, Fasih-Ahmad S, Esmaeilkhanian H, Cannesson M, Wykoff CC, Rahmani E, **Arnold CW**, Zhou B, Zaitlen N, Gronau I, Sankararaman S, Chiang JN, Sadda SR, Halperin E. Accurate prediction of disease-risk factors from volumetric medical scans by a deep vision model pre-trained with 2D scans. Nature Biomedical Engineering. 9(4):507-520, 2025.
7. Mohapatra S*, Issa M*, Ivezic V*, Doherty R, Marks S, Lan E, Chen S, Rozett K, Cullen L, Reynolds W, Rocchio R, Fonarow G, Ong M, Speier W, **Arnold CW**. Increasing Adherence and Collecting Symptom-Specific Biometric Signals in Remote Monitoring of Heart Failure Patients: A Randomized Controlled Trial. Journal of the American Medical Informatics Association, ocae221, 2025.
8. Riskin-Jones H, Raman A, Kulkarni R, **Arnold CW**, Sisk A, Felker E, Lu D, Marks L, Raman S. Performance of MR fusion biopsy, systematic biopsy and combined biopsy on prostate cancer detection rate in 1229 patients stratified by PI-RADSv2 score on 3T multi-parametric MRI. Abdominal Radiology 2025.
9. Chandravadia S, Pendekanti S, Roberts D, Tran R, Panchavati S, **Arnold CW**, Pouratian N, Speier W. Comparing P300 flashing paradigms in online typing with language models. PloS ONE 20(2), 2025.
10. Athreya S*, Radhachandran A*, Ivezić V*, Sant VR, **Arnold CW**, Speier W. Enhancing Ultrasound Image Quality Across Disease Domains: Application of Cycle-Consistent Generative Adversarial Network and Perceptual Loss. JMIR Biomedical Engineering. 2024.
11. Yu P, Zhang H, Wang D, Zhang R, Deng M, Yang H, Wu L, Liu X, Oh AS, Abtin FG, Prosper AE, Ruchalski K, Wang N, Zhang H, Li Y, Lv X, Liu M, Zhao S, Li D, Hoffman JM, Aberle DR, Liang C, Qi S, **Arnold CW**. Spatial resolution enhancement using deep learning improves chest disease diagnosis based on thick-slice CT. NPJ Digital Medicine. 2024 Nov 23;7(1):335.
12. Sant V, Radhachandran A*, Ivezic V*, Lee D, Livhits M, Xu J, Masamed R, **Arnold CW**, Yeh M, Speier W. From Bench-to-Bedside: How Artificial Intelligence Is Changing Thyroid Nodule Diagnostics. The Journal of Clinical Endocrinology & Metabolism, 2024.
13. Radhachandran A, Vittalam A, Ivezic V, Sant V, Athreya S, Moleta C, Patel M, Masamed R, **Arnold CW**, Speier W. ThyGraph: A Graph-Based Approach for Thyroid Nodule Diagnosis from Ultrasound Studies. International Conference on Medical Image Computing and Computer-Assisted Intervention, 753-763, 2024.
14. Zhang H*, Polson J*, Wang Z, Nael K, Rao N, Speier W, **Arnold CW**. A Deep Learning Approach to Predict Recanalization First-Pass Effect Following Mechanical Thrombectomy in Patients with Acute Ischemic Stroke. American Journal of Neuroradiology, 45(8):1044-1052, 2024.
15. Parthasarathy N, Soetedjo J, Panchavati S, Parthasarathy N, **Arnold CW**, Pouratian N, Speier W. High performance P300 spellers using GPT2 word prediction with cross-subject training. Brain-Computer Interfaces, 11(4):210-224, 2024.
16. Johnson L, Harmon S, Yilmaz E, Lin Y, Belue M, Merriman M, Lay N, Sanford T, Sarma K, **Arnold CW**, Xu Z, Roth H, Yang D, Tetreault J, Xu D, Patel K, Gurram S, Wood B, Citrin D, Pinto P, Choyke P, Turkbey B. Automated Prostate Gland Segmentation in Challenging Clinical Cases: Comparison of Three Artificial Intelligence Methods. Abdominal

Radiology, 2024.

17. Radhachandran A, Kinzel A, Chen J, Sant V, Patel M, Masamed R, **Arnold CW**, Speier W. A Multitask Approach for Automated Detection and Segmentation of Thyroid Nodules in Ultrasound Images. Computers in Biology and Medicine, 170, 2024.
18. Sohn A, Turner A, Speier W, Fonarow G, Ong M, **Arnold CW**. Patients with Heart Failure: Internet Use and Mobile Health Perceptions. Applied Clinical Informatics, 2024.
19. Khalil C, Almario C, Dupuy T, **Arnold CW**, Chen Y, Spiegel B. Perspectives, Experiences, and Concerns with Cyclical Vomiting Syndrome: Insights from Online Targeted-disease Forums. Neurogastroenterology & Motility, 32(2):e14712, 2024.
20. Tavakkol E, Kihira S, McArthur M, Polson J, Zhang H, **Arnold CW**, Yoo B, Linetsky M, Salehi B, Ledbetter L, Kim C, Jahan R, Duckwiler G, Saver J, Liebeskind D, Nael K. Automated Assessment of DWI-FLAIR Mismatch in Patients with Acute Ischemic Stroke: Added Value to Routine Clinical Practice. American Journal of Neuroradiology, 2024.
21. Zhang M, Wu Y, Zhang H, Qin Y, Zheng H, Tang W, **Arnold CW**, Pei C, Yu P, Nan Y, Yang G, Walsh S, Marshall D, Komorowski M, Wang P, Guo D, Jin D, Wu Y, Zhao S, Chang R, Zhang B, Lu X, Qayyum A, Mazher M, Su Q, Wu Y, Zhu Y, Yang J, Pakzad A, Rangelov B, Estepar RSJ, Espinosa CC, Sun J, Yang GZ, Gu Y. Multi-site, Multi-domain Airway Tree Modeling. Medical Image Analysis, 90, 2023.
22. Tsui B, Chen I, Nour M, Kihira S, Tavakkol E, Polson J, Zhang H, Qiao J, Bahr-Hosseini B, **Arnold CW**, Tateshima S, Salamon N, Pablo Villablanca J, Colby G, Jahan R, Duckwiler G, Saver J, Liebeskind D, Nael K. Perfusion Collateral Index versus Hypoperfusion Intensity Ratio in Assessment of Collaterals in Patients with Acute Ischemic Stroke. American Journal of Neuroradiology, 44(11):1249-1255, 2023.
23. Yedavalli V, Kihira S, Shahrouki P, Hamam O, Tavakkol E, McArthur M, Qiao J, Johanna F, Doshi A, Vagal A, Khatri P, Srinivasan A, Chaudhary N, Bahr-Hosseini M, Colby G, Nour M, Jahan R, Duckwiler G, **Arnold CW**, Saver J, Mocco J, Liebeskind D, Nael K. CTP-based Estimated Ischemic Core: A Comparative MultiCenter Study Between Olea and RAPID Software. Journal of Stroke and Cerebrovascular Disease, 32(11), 2023.
24. Khalil C, K van Deen W, Dupuy T, Syal G, **Arnold CW**, Cazzetta S, Nazarey P, Almario C, Spiegel B. Patients' Perspectives, Experiences, and Concerns with Perianal Fistulae: Insights From Online Targeted-Disease Forums. Crohn's & Colitis, 5(4), 2023.
25. Wang Z*, Pleasure M*, Zhang H*, Flores K*, Sisk A, Speier W, **Arnold CW**. Deep Learning for Tumor-Associated Stroma Identification in Prostate Histopathology Slides. International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI); Lecture Notes in Computer Science, vol 14225, 2023.
26. Pleasure M*, Redekop E*, Polson J*, Zhang H*, Kaneko N, Speier W, **Arnold CW**. Pathology-Based Ischemic Stroke Etiology Classification via Clot Composition Guided Multiple Instance Learning. Proceedings of the IEEE/CVF International Conference on Computer Vision, 2674-2683, 2023.
27. Rao K*, Speier W, Meng Y*, Wang J, Rames N, Xie F, Su Y, Nowell WB, Curtis J, **Arnold CW**. Machine Learning Approaches to Classify Self-Reported Rheumatoid Arthritis Health Scores Using Activity Tracker Data: Longitudinal Observational Study. JMIR Formative Research, 7:e43107 2023.
28. Panchavati S, Vander Dussen S, Semwal H, Ali A, Chen J, Li H, **Arnold CW**, Speier W. Pretrained Transformers for Seizure Detection. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), June 2023.
29. Rajagolpal A, Redekop E*, Kemisetti A, Kulkarni R*, Sarma K*, Raman S, Magudia K, **Arnold CW**, Larson P. Federated Learning with Research Prototypes: Application to Multi-Center MRI-based Detection of Prostate Cancer with Diverse Histopathology. Academic Radiology, 30(4):644-657, 2023.
30. Kihira S, Derakhshani A, Leung M, Mahmoudi K, Bauer A, Zhang H*, Polson J*, **Arnold CW**, Tsankova N, Hormigo A, Salehi B, Pham N, Ellingson B, Cloughesy T, Nael K. Multi-Parametric Radiomic Model to Predict 1p/19q Co-Deletion in Patients with IDH-1 Mutant Glioma: Added Value to the T2-FLAIR Mismatch Sign. Cancers, 15(4):1037, 2023.
31. Ho M, **Arnold CW**, Decker S, Hazle J, Krupinski E, Mankoff D. Institutional Strategies to Maintain and Grow Imaging Research During the COVID-19 Pandemic. Academic Radiology, 30(4):631-639, 2023.
32. Polson S*, Zhang H*, Nael K, Salamon N, Yoo B, El-Saden S, Starkman S, Kim N, Kang DW, Speier W, **Arnold CW**. Identifying Acute Ischemic Stroke Patients within the Thrombolytic Treatment Window using Deep Learning. Journal of Neuroimaging, 32(6):1153-1160, 2022.
33. Yu P, Zhang H*, Kang H, Tang W, **Arnold CW**, Zhang R. RPLHR-CT Dataset and Transformer Baseline for Volumetric Super-resolution from CT Scans. International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 6:344-353, 2022.
34. Tang W, Kang H, Zhang H*, Yu P, **Arnold CW**, Zhang R. Transformer Lesion Tracker. International Conference on

Medical Image Computing and Computer Assisted Intervention (MICCAI), 6:196-206, 2022.

35. Chen C*, Raymond C, Speier W, Jin X, Cloughesy T, Enzmann D, Ellingson B, **Arnold CW**. Synthesizing MR Image Contrast Enhancement Using 3D High Resolution ConvNets. IEEE Transactions on Biomedical Engineering, 70(2):401-412, 2022.
36. Redekop E*, Sarma K*, Kinnaird A, Sisk A, Raman S, Marks L, Speier W, **Arnold CW**. Attention-guided Prostate Lesion Localization and Grade Group Classification with Multiple Instance Learning. Medical Imaging with Deep Learning (MIDL) Annual Meeting, Proceedings of Machine Learning Research, 172:975-987, Zurich Switzerland; July 2022.
37. Zhang H*, Polson J*, Yang E*, Nael K, Speier W, **Arnold CW**. Predicting Thrombectomy Recanalization from CT Imaging Using Deep Learning Models. Medical Imaging with Deep Learning (MIDL) Annual Meeting. Zurich, Switzerland; July 2022. https://doi.org/10.48550/arXiv.2302.04143
38. Wood J*, **Arnold CW**, Wang W. A Bayesian Topic Model for Human-Evaluated Interpretability. Proceedings of the Language Resources and Evaluation Conference, lrec-1.674:6271-6279, June 2022.
39. Barsky L, Speier W, Fuller G, Cheng S, Kim A, Joung S, **Arnold CW**, Shawan S, Lopez M, Mastali M, van den Broek I, Wei J, Spiegel B, Van Eyk J, Bairey Merz C, Shufelt C. Sex-based Differences in Remote Monitoring of Biometric, Psychometric and Biomarker Indices in Stable Ischemic Heart Disease. Biology of Sex Differences, 13:15 2022.
40. Bulten W, Kartasalo K, Chen PHC, …, Litjens G, Eklund M, & the PANDA challenge consortium. Artificial intelligence for diagnosis and Gleason grading of prostate cancer: the PANDA challenge. Nature Medicine, 28:154-163, 2022.
41. Nobori A, Jumniensuk C, Chen X, Enzmann D, Dry S, Nelson S, **Arnold CW**. An Electronic Health Record-integrated Tumor Board Application to Save Preparation Time and Reduce Errors. Journal of Clinical Oncology Clinical Cancer Informatics, vol 6 2022.
42. Wood J*, **Arnold CW**, Wang W. Knowledge Source Rankings for Semi-supervised Topic Modeling. Information, 13(2), 57, 2022.
43. Li W*, Li J*, Wang Z*, Polson J*, Sisk A, Sajed D, Speier W, **Arnold CW**. PathAL: An Active Learning Framework for Histopathology Image Analysis. IEEE Transactions on Medical Imaging, 41(5):1176-1187, 2022.
44. Li W*, Li J*, Polson J*, Wang Z*, Speier W, **Arnold CW**. High Resolution Histopathology Image Generation and Segmentation through Adversarial Training. Medical Image Analysis, 75, 2022.
45. Sarma KVS*, Raman A*, Dhinagar N*, Priester A, Harmon S, Sanford T, Mehralivand S, Turkbey B, Marks L, Raman S, Speier W, **Arnold CW**. Harnessing Clinical Annotations to Improve Deep Learning Performance in Prostate Segmentation. PLoS ONE, 16(6): e0253829, 2021.
46. Gonzalez G, Vaculik K, Khalil C, Zektser Y, **Arnold CW**, Almario C, Spiegel B, Anger J. Using Large-scale Social Media Analytics to Understand Patient Perspectives About Urinary Tract Infections: Thematic Analysis. Journal of Medical Internet Research, 25;24(1):e26781, 2021.
47. Wang Z*, Li J*, Pan Z*, Li W*, Sisk A, Ye H, Speier WS, **Arnold CW**. Hierarchical Graph Pathomic Network for Progression Free Survival Prediction. International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI); Lecture Notes in Computer Science, vol 12908, 2021.
48. Polson J*, Zhang H*, Nael K, Salamon N, Yoo B, Kim N, Kang D, Speier W, **Arnold CW**. A Semi-Supervised Learning Framework to Leverage Proxy Information for Stroke MRI Analysis. Proceedings of the IEEE Engineering in Medicine and Biology Society (EMBC) Annual Meeting, 2021.
49. Zhang H*, Polson J*, Nael K, Salamon N, Yoo B, Kim N, Speier W, **Arnold CW**. A Machine Learning Approach to Predict Acute Ischemic Stroke Thrombectomy Reperfusion using Discriminative MR Image Features. Proceedings of the IEEE EMBS International Conference on Biomedical and Health Informatics (BHI), 2021.
50. Wood J*, Wang W, **Arnold CW**. The Biased Coin Flip Process for Nonparametric Topic Modeling. International Conference on Document Analysis and Recognition. Lausanne, Switzerland; September 2021.
51. Raman AG*, Sarma KV*, Raman S, Priester A, Mirak S, Riskin-Jones H, Dhinagar N, Speier W, Felker E, Sisk A, Lu D, Kinnaird A, Reiter R, Marks L, **Arnold CW**. Optimizing Spatial Biopsy Sampling for the Detection of Prostate Cancer. The Journal of Urology, 206(3):595-603, 2021.
52. Meng Y*, Speier W, Ong M, **Arnold CW**. Bidirectional Representation Learning from Transformers using Multimodal Electronic Health Record Data to Predict Depression. IEEE Journal of Biomedical and Health Informatics, 25(8):3121-3129, 2021.
53. Zhang H*, Polson JS*, Nael K, Salamon N, Yoo B, El-Saden S, Scalzo F, Speier W, **Arnold CW**, Intra-Domain Task-Adaptive Transfer Learning to Determine Acute Ischemic Stroke Onset Time. Computerized Medical Imaging and Graphics, 90, 2021.

54. Burton C, Gonzalez G, Vaculik K, Khalil C, Zektser Y, **Arnold CW**, Almario C, Spiegel B, Anger J. Female Lower Urinary Tract Symptom Prevention and Treatment Strategies on Social Media: Mixed Correlation with Evidence. Urology, 150:139-145, 2020.
55. Wood J*, Li B, Lee J, **Arnold CW**, Wang W. On the Utility of Combining Topic Models and Recurrent Neural Networks. International Conference on Computing and Information Technology. Bangkok, Thailand; May 2021.
56. Gonzalez G, Vaculik K, Khalil C, Zekster Y, **Arnold CW**, Almario C, Spiegel B, Anger J. Social Media Analytics of Overactive Bladder Posts: What do Patients Know and Want to Know? International Urogynecology Journal, 2021.
57. Li J*, Li W*, Sisk A, Ye H, Wallace W, Speier W, **Arnold CW**. A Multi-resolution Model for Histopathology Image Classification and Localization with Multiple Instance Learning. Computers in Biology and Medicine, 131:104253, 2021.
58. Sarma KVS*, Harmon S, Sanford T, Roth H, Ziyue X, Tetreault J, Xu D, Flores M, Raman A, Kulkarni R, Wood B, Choyke P, Priester A, Marks L, Raman S, Enzmann D, Turkbey B, Speier W, **Arnold CW**. Federated Learning Improves Site Performance in Multi-Center Deep Learning Without Data Sharing. Journal of the American Medical Informatics Association, 12;28(6):1259-1264, 2021.
59. Dhinagar N*, Speier W, Sarma K*, Raman A*, Kinnaird A, Raman S, Marks L, **Arnold CW**. Semi-Automated PIRADS Scoring via mpMRI Analysis. SPIE Journal of Medical Imaging, 7(6):064501, 2021.
60. Sohn A*, Speier W, Lan E, Aoki K, Fonarow G, Ong M, **Arnold CW**. Integrating Remote Monitoring into Heart Failure Patients' Care Regimen: A Pilot Study. PLOS ONE, 15(11):e0242210, 2021.
61. Gonzalez G, Zektser Y, Khalil C, Vaculik K, **Arnold CW**, Almario C, Spiegel B, Anger J. Using Digital Ethnography to Understand the Experience of Women Suffering from Pelvic Organ Prolapse. Female Pelvic Medicine & Reconstructive Surgery, 27(2):e363-e367, 2021.
62. Li B, Mercan E, Mehta S, Knezevich S, **Arnold CW**, Weaver D, Elmore J, Shapiro L. Classifying Breast Histopathology Images with Ductal Instance-oriented Pipeline. International Conference on Pattern Recognition, 2020.
63. Soetedjo J, Keluo-Udeke O, **Arnold CW**, Pouratian N, Speier W. Maintaining High Accuracy General P300 Speller Using the Language Modeling and Dynamic Stopping. IEEE International Symposium on Bioinformatics and Bioengineering, 2020.
64. Shufelt C, Kim A, Joung S, Barsky L, **Arnold CW**, Cheng S, Dhawan S, Fuller G, Speier W, Lopez M, Mastali M, Ouapi KN, van den Broek I, Wei J, Spiegel B, Van Eyk J, Bairey-Merz CN. Biometric and Psychometric Remote Monitoring is Associated with Cardiovascular Risk Biomarkers in Ischemic Heart Disease. Journal of the American Heart Association, 15;9(18):e016023, 2020.
65. Li W*, Wang Z*, Yue Y, Li J, Speier W, Zhou M, **Arnold CW**. Semi-supervised Learning using Adversarial Training with Good and Bad Samples. Machine Vision and Applications, 31(6):49, 2020.
66. Wang Z*, Zhou M, **Arnold CW**. Toward Heterogeneous Information Fusion: Bipartite Graph Convolutional Networks for In Silico Drug Repurposing. Bioinformatics, 36(1), 2020, pp i525–i533.
67. Meng Y*, Speier W, Ong M, **Arnold CW**. HCET: Hierarchical Clinical Embedding with Topic Modeling on Electronic Health Records for Predicting Depression. IEEE Journal of Biomedical and Health Informatics, 25(4):1265-1272, 2020.
68. Enzmann DR, **Arnold CW**, Zaragoza E, Siegel E, Pfeffer MA. Radiology's Information Architecture Could Migrate to One Emulating That of Smartphones. Journal of the American College of Radiology, 17(10):1299-1306, 2020.
69. Guorgui J*, Kinnaird A, Jayadevan R, Priester A, **Arnold CW**, Marks LS. An Electronic Form for Reporting Results of Targeted Prostate Biopsy: Urology Integrated Diagnostic Report (Uro-IDR). Urology, 138:188-193, 2020.
70. Meng Y*, Speier W, Ong M, **Arnold CW**. Multi-Level Embedding with Topic Modeling on Electronic Health Record for Predicting Depression. Association for the Advancement of Artificial Intelligence (AAAI) Explainable AI in Healthcare and Medicine: Building a Culture of Transparency and Accountability Workshop, New York, NY; February 2020.
71. Gonzalez G, Vaculik K, Khalil C, Zektser Y, **Arnold CW**, Almario C, Spiegel B, Anger J. Women's Experience with Stress Urinary Incontinence: Insights from Social Media Analytics. The Journal of Urology, 203(5):962-968, 2020.
72. Shufelt C, Dzubur E, Joung S, Fuller G, Moupai KN, Van Den Broek I, Lopez M, Dhawan S, **Arnold CW**, Speier W, Mastali M, Fu Qin, Van Eyk J, Spiegel B, Bairey Merz CN. A Protocol Integrating Remote Patient Monitoring, Patient Reported Outcomes, and Cardiovascular Biomarkers. Nature Partner Journals: Digital Medicine 84, 2019.
73. Sohn A*, Speier W, Lan E, Aoki K, Fonarow G, Ong M, **Arnold CW**. Assessment of Heart Failure Patients' Interest in Mobile Health Apps for Self-Care: Survey Study. Journal of Medical Internet Research Cardio, 15(11):e0242210, 2019.
74. Yu Y, Parsi B, Speier W, **Arnold CW**, Lou M, Scalzo F. LSTM Network for Prediction of Hemorrhagic Transformation in Acute Stroke. International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), 2019.

75. Meng Y*, Speier W, Shufelt C, Joung S, Van Eyk JE, Bairey Merz CN, Lopez M, Spiegel B, **Arnold CW**. A Machine Learning Approach to Classifying Self-Reported Health Status in a cohort of Patients with Heart Disease using Activity Tracker Data. IEEE Journal of Biomedical and Health Informatics, 24(3), 2019.
76. Li J*, Li W, Gertych A, Knudsen BS, Speier W, **Arnold CW**. An Attention-Based Multi-Resolution Model for Prostate Whole Slide Image Classification and Localization. Conference on Computer Vision and Pattern Recognition (CVPR) Towards Causal, Explainable and Universal Medical Visual Diagnosis Workshop, 2019.
77. Li W*, Wang Z*, Li J, Polson J*, Speier W, **Arnold CW**. Semi-Supervised Learning Based on Generative Adversarial Network: A Comparison Between Good GAN and Bad GAN Approach. Conference on Computer Vision and Pattern Recognition (CVPR) Weakly Supervised Learning for Real-World Computer Vision Applications Workshop, 2019.
78. Ho KC*, Scalzo F, Sarma KV*, Speier W, El-Saden S, **Arnold CW**. Predicting ischemic stroke tissue fate using a deep convolutional neural network on source magnetic resonance perfusion images. Journal of Medical Imaging 6(2), 2019.
79. Sarma KV*, Spiegel BM, Reid M, Chen S*, Merchant R, Seltzer E, **Arnold CW**. Estimating the Health-Related Quality of Life of Twitter Users Using Semantic Processing. Proceedings of the International Medical Informatics Association (IMIA) 17th World Congress on Medical and Health Informatics (MEDINFO), Studies in Health Technology and Informatics, Aug 2019, 264 pp. 1065-1069.
80. Ho KC*, Speier W, Zhang H*, Scalzo F, El-Saden S, **Arnold CW**. A Machine Learning Approach for Classifying Ischemic Stroke Onset Time from Imaging. IEEE Transactions on Medical Imaging, 38(7), 2019, pp. 1666-1676.
81. Li W*, Li J*, Sarma KV*, Ho KC*, Shen S, Knudsen BS, Gertych A, **Arnold CW**. Path R-CNN for Prostate Cancer Diagnosis and Gleason Grading of Histological Images. IEEE Transactions on Medical Imaging 38(4), 2018, pp. 945-954.
82. Li J*, Speier W, Ho KC*, Sarma KV*, Gertych A, Knudsen B, **Arnold CW**. An EM-based semi-supervised deep learning approach for semantic segmentation of histopathological images from radical prostatectomies. Computerized Medical Imaging and Graphics 69, 2018, pp. 125-133.
83. Dzubur E, Khalil C, Almario CV, Noah B, Minhas D, Ishimori M, **Arnold CW**, Park Y, Kay J, Weisman MH, Spiegel BMR. Patients' Concerns and Perceptions Regarding Biologic Therapies in Ankylosing Spondylitis. Arthritis Care & Research 71(2), 2018, pp. 323-330.
84. Speier W*, Dzubur E, Zide M, Shufelt C, Joung S, Van Eyk JE, Merz CNB, Lopez M, Spiegel B, **Arnold CW**. Evaluating Utility and Compliance in a Patient-based eHealth Study using Continuous-time Heart Rate and Activity Trackers. Journal of the American Medical Informatics Association, 25(10), 2018, pp. 1386-1391.
85. Ing N, Ma Z, Li J*, Salemi H, **Arnold CW**, Knudsen B, Gertych A. Semantic Segmentation Convolutional Neural Networks for Prostate Cancer Grading. SPIE Medical Imaging 2018.
86. Speier W, **Arnold CW**, Chandravadia N, Roberts D, Pendekanti S, Pouratian N. Improving P300 Spelling Rate Using Language Models and Predictive Spelling. Brain Computer Interfaces 5(1) 2017, pp. 13-22.
87. Li J*, Sarma KV*, Ho KC*, Gertych A, Knudsen B, **Arnold CW**. A Multi-scale U-Net for Semantic Segmentation of Histological Images from Radical Prostatectomies. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium. 2017, pp. 1140-1148. Finalist, Best Student Paper Award.
88. Ho KC*, Speier W*, El-Saden S, **Arnold CW**. Classifying Acute Ischemic Stroke Onset Time using Deep Imaging Features. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium. 2017, pp. 892-901. Winner, Martin Epstein Best Student Paper Award.
89. Wood J*, Tan P, Das A, Wang W, **Arnold CW**. Source-LDA: Enhancing Probabilistic Topic Models using Prior Knowledge Sources. Proceedings of the IEEE International Conference on Data Engineering. 2016, pp. 411-422.
90. Ho KC*, Scalzo F, Sarma K*, El-Saden S, **Arnold CW**. A Temporal Deep Learning Approach for MR Perfusion Parameter Estimation in Stroke. Proceedings of the International Conference on Pattern Recognition 2016, pp. 1315-1320.
91. Speier W*, **Arnold CW**, Pouratian N. Integrating Language Models into Classifiers for BCI Communication: A Review. Journal of Neural Engineering. 13(3), 2016.
92. Speier W*, Ong MK, **Arnold CW**. Using Phrases and Document Metadata to Improve Topic Modeling of Clinical Reports. Journal of Biomedical Informatics. 61, 2016 pp. 260-266.
93. McNamara M*, Caswell K, Peterson E, Aberle DR, Bui AAT, **Arnold CW**. Consumers' Patient Portal Preferences and Health Literacy: A Survey Using Crowdsourcing. JMIR Research Protocols. 5(2), 2016 e104.
94. **Arnold CW**, Oh A*, Chen X*, Speier W*. Evaluating Topic Model Interpretability from a Primary Care Physician Perspective. Computer Methods and Programs in Biomedicine. 124, 2016 pp. 67-75.

95. **Arnold CW**, Wallace WD, Chen S, Oh A*, Abtin F, Genshaft S, Binder S, Aberle D, Enzmann D. Rad-Path: A Web-Based System for Integrating and Correlating Radiology and Pathology Findings During Cancer Diagnosis. Academic Radiology. 23(1), 2016 pp. 90-100. Selected by the International Medical Informatics Association (IMIA) as a best of informatics article and featured in the 2017 IMIA Yearbook of Medical Informatics.
96. Hsu W, Han S, **Arnold CW**, Bui AAT, Enzmann D. A Data-driven Approach for Quality Assessment of Radiologic Interpretations. Journal of the American Medical Informatics Association (JAMIA), 2015, doi 10.1093/jamia/ocv161.
97. Whitman CB, Reid MW, **Arnold CW**, Patel H, Ursos L, Sa'adon R, Pourmorady J, Spiegel B. Balancing Opioid-Induced Gastrointestinal Side Effects with Pain Management: Insights from the Online Community. Journal of Opioid Management. 11(5), 2015, pp. 383-91.
98. Speier W*, **Arnold CW**, Deshpande A, Knall J, Pouratian N. Incorporating Advanced Language Models into the P300 Speller using Particle Filtering. Journal of Neural Engineering. 12(4), 2015.
99. Oh A*, **Arnold CW**, Vangala S, Wallace WD, Genshaft S, Sarma K, Aberle D. Imaging-histologic Discordance at Percutaneous Biopsy of the Lung. Academic Radiology 22(4), 2015 pp. 481-487.
100. Ho KC*, Speier W*, El-Saden S, Liebeskind DS, Saver JL, Bui AAT, **Arnold CW**. Predicting Discharge Mortality after Acute Ischemic Stroke. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium, AMIA 2014, pp. 1787-96. Finalist, Best Student Paper Award.
101. McNamara M*, Sarma K*, Aberle D, Bui AAT, **Arnold CW**. Data Model for Personalized Patient Health Guidelines: An Exploratory Study. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium, AMIA 2014, pp. 1835-44.
102. Speier W*, **Arnold CW**, Lu J, Deshpande A, Pouratian N. Integrating Language Information with a Hidden Markov Model to Improve Communication Rate in the P300 Speller. IEEE Transactions on Neural Systems & Rehabilitation Engineering. 22(3), 2014, pp. 678-684.
103. McNamara M*, **Arnold CW**, Sarma K*, Garon E, Aberle D, Bui AAT. Patient Portal Preferences: Perspectives on Imaging Information. Journal of the Association for Information Science and Technology (JASIST). 66(8), 2013, pp. 1606-15.
104. Speier W*, **Arnold CW**, Pouratian N. Evaluating True BCI Communication Rate through Mutual Information and Language Models. PLoS ONE. 8(10), e78432, 2013.
105. Bui AAT, Hsu W, **Arnold CW**, El-Saden S, Aberle DR, Taira RK. Imaging-based Observational Databases for Clinical Problem Solving: the Role of Informatics. Journal of the American Medical Informatics Association (JAMIA), 20(6), 2013, pp. 1053-8.
106. **Arnold CW**, McNamara M*, Chen S*, Taira R, Bui AAT. Imaging Informatics for Consumer Health: Towards a Radiology Patient Portal. Journal of the American Medical Informatics Association (JAMIA) 20(6), 2013, pp. 1028-36.
107. Speier W*, **Arnold CW**, Lu J, Taira R, Pouratian N. Natural Language Processing with Dynamic Classification Improves P300 Speller Accuracy and Bit Rate. Journal of Neural Engineering 9(1), 2012.
108. Speier W*, Iglesias JE, El-kara L, Tu Z, **Arnold CW**. Robust Skull Stripping of Clinical Glioblastoma Multiforme Data. MICCAI '11 Proceedings of the 14th International Conference on Medical Image Computing and Computer-Assisted Intervention - Volume Part III 2011, pp. 659-666.
109. Singleton K, Lan M, **Arnold CW**, Arangua L, Bui AAT, Gelberg L. Wireless Data Collection of Self-administered Surveys using Tablet Computers. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium. 2011, pp. 1261-1269.
110. Hsu W, **Arnold CW**, Taira RK. A Neuro-oncology Workstation for Structuring, Modeling, and Visualizing Patient Records. Proceedings of the Association of Computing Machinery International Conference on Health Informatics, 2010, pp. 837-840.
111. **Arnold CW**, El-Saden SM, Bui AAT, Taira RK. Clinical Case-based Retrieval using Latent Topic Analysis. Proceedings of the American Medical Informatics Association (AMIA) Annual Symposium. 2010, pp. 26-30.
112. **Arnold CW**, Bui AAT, Morioka C, El-Saden S, Kangarloo H. A Prototype Web-based Reporting System for Onsite-offsite Clinician Communication. RadioGraphics, 27(4), 2007, pp. 1201-1211.

Book Chapters

1. Watt E, **Arnold CW**, Sayre J. Chapter 10: Evaluation. Medical Imaging Informatics. Springer-Verlag (eds. Bui AAT, Taira RK), 2010.

Conference Abstracts and Posters: Peer Reviewed

1. Fukuda K, Ghochani Y, Enzmann D, **Arnold CW**, Chen X, Morales J, Kimball D, Beaman C, Duckwiler G, Jahan R, Tateshima S, Szeder V, Kaneko N, Nour M. Efficacy of an Incidental Aneurysm Alert System (IAAS) and the Associated Disparities of Incidentally Detected Intracranial Aneurysms. Society of NeuroInterventional Surgery 20th Annual Meeting; July 2023.
2. Wang Z*, Pleasure M*, Redekop E*, Sisk A, Flores K, Speier W, **Arnold CW**. Deep Learning for Tumor-associated Stroma Identification in Prostate Radical Prostatectomy Whole-mount Histopathology Slides. Association for Pathology Informatics Annual Summit; May 2023.
3. Olivares C*, Redekop E*, Speier W, **Arnold CW**. Masked Autoencoder Pre-training for Prostate Cancer Detection. Association for Pathology Informatics Annual Summit; May 2023.
4. Redekop E*, Pleasure M*, Sisk A, Flores K, Speier W, **Arnold CW**. Morphology Preserving Alignment of Histology Images for Volumetric Analysis. Association for Pathology Informatics Annual Summit; May 2023.
5. Pleasure M*, Redekop E*, Polson J*, Speier W, **Arnold CW**. Ischemic Stroke Etiology Classification from Clot Histology using Attention-based Multiple Instance Learning. Association for Pathology Informatics Annual Summit; May 2023.
6. Khalil C, van Deen W, Dupuy T, Syal G, **Arnold CW**, Cazzetta S, Nazarey P, Spiegel B. Patients' Perspectives, Experiences, and Concerns with Crohn's Perianal Fistulae: Insights from Social Media Platforms. Inflammatory Bowel Diseases, 28(1):S92–S93, 2022.
7. Tsui B, Chen I, Qiao J, Nour M, Sharma L, Tateshima S, Hosseini M, Colby G, Salomon N, **Arnold CW**, Saver J, Liebeskind D, Nael K. Perfusion Collateral Index vs. Hypoperfusion Intensity Ratio in Assessment of Angiographic Collateral Scores in Patients with Acute Ischemic Stroke. Radiological Society of North America Annual Meeting; Nov 2021.
8. Chen I, Tsui B, Qiao J, Hsu W, Sharma L, Hosseini M, Nour M, Hinman J, Kim D, Rao N, Salomon N, **Arnold CW**, Saver J, Liebeskind D, Nael K. Automated Estimation of Ischemic Core Volume on Non–contrast Enhanced CT via Machine Learning. Radiological Society of North America Annual Meeting; Nov 2021.
9. Benita T, Gresham G, Joung S, **Arnold CW**, Dhawan S, Fuller G, Speier W, Mastali M, Mouapi K, van den Broek I, Wei J, Spiegel B, Van Eyk J, Noel Bairey Merz N, Shufelt C. Remote Patient Monitoring for Predicting Major Adverse Cardiac Events and Cardiovascular Hospitalizations in Patients with Stable Ischemic Heart Disease. American College of Cardiology Annual Meeting, Virtual; 2021.
10. Patient Reported Functional Status as a Predictor for N-Terminal Pro Brain Natriuretic Peptide and Cardiovascular Hospitalizations in Patients with Stable Ischemic Heart Disease. Benita T, Gresham G, Joung S, **Arnold CW**, Dhawan S, Fuller G, Speier W, Mastali M, Mouapi K, van den Broek I, Wei J, Spiegel B, Van Eyk J, Noel Bairey Merz N, Shufelt C. American College of Cardiology Annual Meeting, Virtual; 2021.
11. Longitudinal Trajectories of Remotely-Monitored Activity Data in Patients with Stable Ischemic Heart Disease. Gresham G, Benita T, Joung S, **Arnold CW**, Dhawan S, Fuller G, Speier W, Mastali M, Mouapi K, van den Broek I, Wei J, Spiegel B, Van Eyk J, Noel Bairey Merz N, Shufelt C. American College of Cardiology Annual Meeting, Virtual; 2021.
12. Zhang Z, Li J, Li W, Zheng H, Mirak S, Shakeri S, Priester A, Magyar C, Sisk A, Reiter R, Sung K, Raman S, Enzmann D, **Arnold CW**, Wu H. A Framework for Characterizing Prostate Cancer Heterogeneity Using Voxel-Wise Co-Registered Ex Vivo MRI and Whole-Mount Histopathology. International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting, Virtual; May 2021.
13. Nobori A, Chayanit J, Chen S, Dry S, Nelson S, **Arnold CW**. The Use of a Novel Digital Tumor Board Platform Reduces Pathologist Tumor Board Preparation Time and Enhances Clinician Satisfaction: the UCLA Experience. United States and Canadian Academy of Pathology Annual Meeting, Virtual; March 2021.
14. Raman A, Lad M, Parikh N, Gupta R, Gupta R, Patel A, **Arnold CW**. Trends in Utilization and Medicare Reimbursement for TIPS and Open Surgical Portal Decompression. Society of Interventional Radiology Annual Meeting, Virtual; March 2021.
15. Harmon S, Sarma K*, Sanford T, Roth H, Xu Z, Kulkarni R*, Mehralivand S, Masoudi S, Walker S, Choyke P, Flores M, Wood B, Enzmann D, Xu D, Raman S, **Arnold CW**, Turkbey B. Practical Guide to Federated Learning for Clinical Research Scientists. Radiological Society of North America Annual Meeting, Virtual; Nov 2020.
16. Riskin-Jones H, Kulkarni R*, **Arnold CW**, Sisk A, Felker E, Quirk M, Lu D, Marks L, Raman S. Added Value of Ipsilateral vs Contralateral Systematic Biopsy Cores to MR targets on Transrectal US MR Fusion Biopsy for Detection of Clinically Significant Prostate Cancer. Radiological Society of North America Annual Meeting, Virtual; Nov 2020.
17. Raman A*, Raman S, Sarma K, Priester A, Dhinagar N*, Speier W*, **Arnold CW**. 3D-Tracking Software Reveals How Systematic Biopsy Augments 3T multiparametric MRI Targeted Fusion Biopsy in Clinically Significant Prostate Cancer Detection. Radiological Society of North America Annual Meeting, Virtual; Nov 2020.
18. Riskin-Jones H, Kulkarni R*, **Arnold CW**, Sisk A, Felker E, Quirk M, Lu D, Marks L, Raman S. Performance of MR Fusion Biopsy, Systematic Biopsy or Combined Biopsy for Prostate Cancer Detection Rate in 983 Patients Stratified by PI-RADSv2.1 Score on 3T Multiparametric MRI. Radiological Society of North America Annual Meeting, Virtual; Nov 2020.
19. Polson J*, Zhang H*, Nael K, Salamon N, Yoo B, El-Saden S, Speier W, **Arnold CW**. Evaluating Automated Approaches

for Classifying Stroke Onset Time. Radiological Society of North America Annual Meeting, Virtual; Nov 2020. Winner, Trainee Research Prize.

20. Sarma K*, Harmon S, Sanford T, Roth H, Flores M, Kulkarni R*, Wood B, Choyke P, Raman S, Enzmann D, Turkbey B, Speier W, **Arnold CW**. Data-Distributed Deep Learning using Federated Learning: A Case Study. Radiological Society of North America Annual Meeting, Virtual; Nov 2020. Winner, Trainee Research Prize.
21. Raman AG*, Sarma KV, Shi W*, Zhou S, Priester A, Natarajan S, Speier W, Raman S, Marks L, **Arnold CW**. A Machine Learning Model for Predicting Cancer Presence in Prostate Biopsy Targets Using MRI. American Urological Association Annual Meeting, Chicago, IL; May 2019.
22. Zhou S, Priester A, Jayadevan R, Yang J, Johnson D, Raman AG*, Sarma KV*, **Arnold CW**, Ballon J, Natarajan S, Marks L. Predicting Prostate Cancer Focal Therapy Eligibility with Machine Learning. American Urological Association Annual Meeting, Chicago, IL; May 2019.
23. Ikoma S, Chen S*, Abtin F, Genshaft S, Lu S, Raman S, Sisk A, Suh R, **Arnold CW**, Wallace WD. The UCLA experience of formalized pathology-radiology correlative reporting using an integrated diagnostic platform. Pathology Informatics Summit, Pittsburgh, PN; May 2019.
24. Zektser Y, Gonzalez G, Vaculik K, Khalil C, **Arnold CW**, Almario C, Spiegel B, Anger J. Patient Perspectives about Urinary Tract Infections: Results of Large-Scale Social Media Analytics to Understand Public Knowledge and Experience. Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
25. Scott VCS, Gonzalez G, Zektser Y, Thum LW, Sadun T, Maliski SL, **Arnold CW**, Spiegel B, Kim J, Anger J. Focus Groups Versus Digital Ethnography: Which Better Captures the Perspectives of Women with Recurrent Urinary Tract infections? Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
26. Gonzalez G, Zektser Y, Vaculik K, Khalil C, **Arnold CW**, Almario C, Spiegel B, Anger J. What can We Learn from Women's Online Discussions of Interstitial Cystitis/Bladder Pain Syndrome? Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
27. Gonzalez G, Zektser Y, Khalil C, Vaculik K, **Arnold CW**, Almario C, Spiegel B, Anger J. A Large-scale Social Media Analysis of Overactive Bladder Posts: What do Patients Know and Want to Know? Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
28. Gonzalez G, Zektser Y, Khalil C, Vaculik K, **Arnold CW**, Almario C, Spiegel B, Anger J. Using Digital Ethnography to Understand the Biopsychosocial Illness Experience of Women Suffering from Pelvic Organ Prolapse. Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
29. Gonzalez G, Zektser Y, Khalil C, Vaculik K, **Arnold CW**, Almario C, Spiegel B, Anger J. Womens' Experience with Stress Urinary Incontinence: Insights from a Qualitative Social Media Analysis. Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU), Miami FL; April 2019.
30. Dewan R, Wallace WD, **Arnold CW**, Suh R, Genshaft S, Abtin F. Integrated Diagnostic Report in Management of Patients Following Lung Biopsy. Society of Thoracic Radiology, Savannah, GA; March 2019. Best Scientific Presentation Award.
31. Shi W*, Sarma KV*, Raman AG*, Priester AM, Natarajan S, Speier W, Raman S, Marks L, **Arnold CW**. Prediction of Clinically Significant Prostate Cancer in MR/Ultrasound Guided Fusion Biopsy using Multiparametric MRI. Neural Information Processing Systems (NeurIPS) Machine Learning for Health Workshop, Montreal, CA; December 2018.
32. Sarma K*, Spiegel B, Reid M, Chen S, Merchant R, Seltzer E, **Arnold CW**. Estimating Health-related Quality of Life of Twitter Users: Methods for Semantic Processing of Social Media Posts. American Medical Informatics Association (AMIA) Annual Symposium, 2018, San Francisco, CA; November 2018.
33. Meng Y*, Speier W*, **Arnold CW**. Predicting Patient Health Status using Activity Tracker Data. American Medical Informatics Association (AMIA) Annual Symposium, 2018, San Francisco, CA; November 2018.
34. Li J*, Speier W*, Ho KC*, Sarma K*, Gertych A, Knudsen BS, **Arnold CW**. An EM-based Semi-supervised Deep Learning Approach for Semantic Segmentation of Histopathological Images. Gordon Research Conference in Advanced Health Informatics, Hong Kong, CN; June 2018.
35. Li W*, Li J*, Sarma K*, Ho KC*, Gertych A, Knudsen BS, **Arnold CW**. Path R-CNN: A Whole-slide Histological Image Segmentation Model Based on a Region-based Convolutional Neural Network. Gordon Research Conference in Advanced Health Informatics, Hong Kong, CN; June 2018.
36. **Arnold CW**, Speier W*, Aoki K, Wang E, Chen X, Fonarow G, Ong M. An mHealth Protocol for Monitoring Heart Failure Patients Following Hospital Discharge. Gordon Research Conference in Advanced Health Informatics, Hong Kong, CN; June 2018.
37. Sarma KV*, Zhong X, Ho KC*, Margolis DJ, Raman S, Scalzo F, Sung KH, Tan N, **Arnold CW**. An Investigational Patch-based Convolutional Neural Network Model for the Detection of Clinically Significant Prostate Cancer using Multiparametric MRI. Radiological Society of North America Annual Meeting, Chicago, IL; Nov 2016. Winner, Trainee Research Prize.

38. Ho KC*, Scalzo F, Sarma KV*, El-Saden S, **Arnold CW**. A Novel Bi-input Convolutional Neural Network for Deconvolution-free Estimation of Stroke MR Perfusion Parameters. Radiological Society of North America Annual Meeting, Chicago, IL; Nov 2016.
39. Sarma KV*, Zhong X, Ho KC*, Margolis DJA, Raman S, Scalzo F, Sung KH, Tan N, **Arnold CW**. Development of a Deep Learning Model for the Detection of Prostate Cancer using MRI. Gordon Research Conference in Advanced Health Informatics. Hong Kong; June 2016.
40. Reid M, Keller M, Whitman C, **Arnold CW**, Dailey F, Spiegel B. Comparison of Health-Related Quality of Life in Crohn's Disease and Ulcerative Colitis: A Digital Ethnography Study of Social Media Data. Digestive Disease Week 2016, San Diego, CA; May 2016.
41. Ho KC*, El-Saden S, Scalzo F, Bui AAT, **Arnold CW**. Predicting Acute Ischemic Stroke Tissue Fate Using Deep Learning on Source Perfusion MRI. American Heart Association International Stroke Conference (ISC), Los Angeles, CA; February 2016.
42. Rogers P, Garnavi R, Goldschmidt Y, Mahatma S, **Arnold CW**. Healthcare IT-as-a-Service: How Cloud is Impacting the Health IT Industry. International Medical Informatics Association 15th World Congress on Medical and Health Informatics, Sao Paulo, Brazil; Aug 2015.
43. Han SX, Hsu W, **Arnold CW**, Margolis DJ, Bui AAT, Enzmann DR. RadQA: Automated Quality Control of Radiological Interpretations in Prostate Cancer. Radiological Society of North America Annual Meeting Annual Meeting, Chicago, IL; Nov 2014.
44. Ho KC*, Speier W*, El-Saden S, Liebeskind D, Saver J, Bui AAT, **Arnold CW**. Predicting Discharge Mortality in Acute Ischemic Stroke Patients using Support Vector Machines and Affinity Propagation. Meaningful Use of Complex Medical Data (MUCMD), Los Angeles, CA; 2014.
45. Hsu W, Han SX, **Arnold CW**, Bui AAT, Enzmann DR. RadQA: A Data-driven Approach to Assessing the Accuracy and Utility of Radiologic Interpretations. Society for Imaging Informatics in Medicine, Long Beach, CA; May 2014.
46. Whitman C, **Arnold CW**, Patel H, Scopel J, Martinez B, Reid M, Spiegel B. Managing Opioid Induced Constipation: Perceptions and Misconceptions from the Online Community. American College of Gastroenterology Annual Scientific Meeting, Philadelphia, PA; Oct 2014.
47. Whitman C, **Arnold CW**, Patel H, Scopel J, Reid M, Spiegel B. Balancing Pain Relief and Opioid-Induced Gastrointestinal Side Effects: Insights from a Structured Review of Social Media. PAINWeek 2014. Las Vegas, NV; Aug 2014.
48. **Arnold CW**, D Wallace, Abtin FG, Ellingson B, Bui AAT, Binder S, Aberle D, Enzmann D. RadPath: An Electronic Platform to Integrate Radiology and Pathology Consultations for Indeterminate Lesions. Radiological Society of North America Annual Meeting, Chicago, IL; Dec 2013.
49. McNamara M*, **Arnold CW**, Aberle D, Bui AAT. A Radiology Patient Portal with Personalized Guidelines for Non-small Cell Lung Cancer. Radiological Society of North America Annual Meeting, Chicago, IL; Nov 2013.
50. Garcia-Gathright J, **Arnold CW**, Bui AAT. Automatic Extraction of Patient Characteristics from Clinical Reports. Radiological Society of North America Annual Meeting, Chicago, IL; Nov 2013.
51. Taira RK, **Arnold CW**. Hierarchical Semantic Structures for Medical NLP. International Medical Informatics Association 14th World Congress on Medical and Health Informatics, 2013. Nominated, Distinguished Poster Award.
52. Chen S*, **Arnold CW**. Integrating UIMA Annotators in a Web-based Text Processing Framework. International Medical Informatics Association 14th World Congress on Medical and Health Informatics, 2013. Winner, Distinguished Poster Award.
53. Love A*, **Arnold CW**, El-Saden S, Liebeskind DS, Andrada L, Saver J, Bui AAT. Unifying Acute Stroke Treatment Guidelines for a Bayesian Belief Network. International Medical Informatics Association 14th World Congress on Medical and Health Informatics, 2013.
54. **Arnold CW**, Nguyen T, Janzen C. BabySTEPS: A Sugar Tracking Electronic Portal System for Gestational Diabetes. International Medical Informatics Association 14th World Congress on Medical and Health Informatics, 2013.
55. Strom DE, Sheen V, **Arnold CW**, Spiegel BM, van Oijen M. Measuring Health Related Quality of Life (HRQOL) in Crohn's Disease Using Twitter: A Pilot Study of Social Media as a Novel Tool to Assess Disease Burden. Digestive Disease Week 2013, Chicago IL.
56. **Arnold CW** and Speier W*. A Topic Model of Clinical Reports. Association for Computing Machinery (ACM) SIGIR '12 Proceedings of the 35th International Association for Computing Machinery Special Interest Group on Information Retrieval Annual Conference on Research and Development in Information Retrieval, 2012, pp. 1031-1032.
57. **Arnold CW**, Love A*, El-Saden S, Liebeskind DS, Andrada L, Saver M, Bui A. A Bayesian Network for Reasoning on Acute Ischemic Stroke Intervention. AHA International Stroke Conference (ISC), Honolulu HI, 2012.
58. Gelberg L, Andersen RM, Shoptaw S, Arangua L, Barth-Rogers Y, Vahidi M, Singleton K, **Arnold CW**, Bui AAT, Leake BD. SBIRT for Risky Stimulant Use in a Skid Row Community Health Center. International Network on Brief Interventions for Alcohol Problems (INEBRIA) 2011, Boston, MA.

59. **Arnold CW**, Bui AAT, El-Saden M, Aberle DR, Taira RK. Image and Report Indexing through Automated Topic Discovery. RSNA Annual Meeting, Chicago, IL; Nov 2011.
60. **Arnold CW**, Chen X*, McNamara M*, El-Saden S, Taira R. A Web-based Patient Radiology Portal for Result Presentation and Education. RSNA Annual Meeting, Chicago, IL; Nov 2011.
61. Speier W*, **Arnold CW**, Hsu W, Bui AAT. Content-based Image Retrieval using Feature Density Estimates. American Medical Informatics Association (AMIA) Annual Symposium, 2011.
62. Hsu W, **Arnold CW**, Chern A, Taira RK, Kangarloo H. Tools for Characterizing, Visualizing, and Comparing Trends in Neuro-oncology Patients RSNA Annual Meeting, Chicago, IL; Nov 2010.
63. **Arnold CW**, Davis M, Knoop S, Gruhl D. A Scalable Architecture for Medical Report Driven Information Retrieval. American Medical Informatics Association (AMIA) Annual Symposium, 2009.

PREVIOUS AND CURRENT PHD STUDENTS

Name	Degree	Program	Graduation Date	Role
1. Carlos Olivares	PhD	Medical Informatics Home Area	2026	Committee Chair
2. Mara Pleasure	PhD	Medical Informatics Home Area	2026	Committee Chair
3. Guorui Chen	PhD	Bioengineering	2025	Committee Member
4. Ekaterina Redekop	PhD	Bioengineering	2025	Committee Chair
5. Yijie Zhang	PhD	Electrical & Computer Eng.	2025	Committee Member
6. Ruiwen Ding	PhD	Bioengineering	2025	Committee Member
7. Hongyan Gu	PhD	Electrical & Computer Eng	2025	Committee Member
8. Nicholas Cho	PhD	Bioengineering	2024	Committee Member
9. Zichen Wang	PhD	Bioengineering	2024	Committee Chair
10. Kim Yeun	PhD	Bioengineering	2024	Committee Chair
11. Jake Pensa	PhD	Bioengineering	2024	Committee Chair
12. Simon Han	PhD	Bioengineering	2023	Committee Member
13. Jennifer Polson	PhD	Bioengineering	2023	Committee Chair
14. Zhaohuan Zhang	PhD	Bioengineering	2024	Committee Member
15. Haoyue Zhang	PhD	Bioengineering	2022	Committee Chair
16. Tianran Zhang	PhD	Bioengineering	2022	Committee Member
17. Yudi Sang	PhD	Biomedical Physics	2022	Committee Member
18. Jiayun Li	PhD	Bioengineering	2021	Committee Chair
19. Karthik Sarma	PhD	Bioengineering	2021	Committee Chair
20. Justin Wood	PhD	Computer Science	2020	Committee Chair
21. Wenyuan Li	PhD	Electrical & Computer Eng.	2020	Committee Chair
22. Yiwen Meng	PhD	Bioengineering	2020	Committee Chair
23. King Chung Ho	PhD	Bioengineering	2019	Committee Chair
24. Mary Zide	PhD	Bioengineering	2016	Committee Chair
25. William Speier	PhD	Biomedical Engineering	2015	Committee Member