

Daniel Craig McFarlane, ScD.

2150 S. 1300 E., Ste. #500, Salt Lake City, UT, 84106, USA

<https://www.linkedin.com/in/daniel-c-mcfarlane-sc-d-a5578a15/>

INTRODUCTION

A proven science and innovation leader focused on creating and delivering safety-critical, real-time, intelligent solutions that empower and protect essential workers and the people they serve. Domains include: public health, healthcare, and national security. Notable successes include: pre-symptomatic detection of infection to prevent the spread of contagious diseases (esp. COVID-19); biotelemetry from wearables for real-time monitoring of health threats; pre-symptomatic detection of exposure to hazardous chemicals (including pharmaceuticals); improving alarm safety for healthcare delivery and prevention of medical errors and their associated adverse events; improving alarm safety for military command and control; novel wearable human-computer interaction (HCI) technologies for safety-critical operations; integrated environmental monitoring and edge computing devices; and end-user development of artificial intelligence (AI)-enabled decision-aids by/for essential workers.

APPROACH

Science and innovation require carefully-structured customized ideation contexts to support the thought work needed to make progress on important objective problems. There are very many, diverse, and ubiquitous sources of potential confound, distortion, and distraction. Any of which can easily derail a science or innovation effort and result in failure. Mitigating these risks is difficult and expensive, but critical meta-level thought work that must start at the beginning of any project.

Although knowledge, skill and experience have the potential to make progress happen faster, clarity of thought is the primary key to get a project oriented in a useful direction. An effective approach has five pillars:

- Sponsorship with commitment, stability, and focus on an important objective problem;
- Project leadership with commitment, trustworthiness, and clarity of thought;
- A performance team with commitment, trustworthiness, and extreme diversity;
- Extreme participation of all stake-holders in clarifying the problem(s) and defining objective "success;"
- A structured specific process (that fits the aims) to guide ideation, and operationalization into commercially-viable solutions.

GROWTH

A proven record of success leading, managing, and contributing to accelerated organizational growth to expand organizations' positive impact and contribution to public health and national security.

Twice, I have significantly contributed to growth that doubled organizational size (Philips Research North America, Connected Care & Personal Health; and Lockheed Martin Advanced Technology Labs, AI Lab). My contributions included: strong extramural funding; extreme collaborative diversity; foundational scientific breakthroughs, mission-centric strategic planning, and risk mitigation; high-value patient- or warfighter-centric innovation; generation of IP; publishing (mass media, scientific journals, and conferences); large, diverse, multi-organization, multidisciplinary, international teams; product integration and monetization; practical/durable legal contracts; international talent recruitment; policies

for the protection of human-subjects and data privacy; and relationship building across multiple investor and stakeholder communities.

RESEARCH AIM

Empower and protect essential workers and the people they serve with scientific breakthroughs, high-value technology innovations, and successful business products that: improve public health safety, and mission outcomes; and eliminate health risks, costly errors and prevent tragedies.

Examples of end-to-end successes achieving this aim include: maintaining workforce readiness for essential workers during the COVID-19 pandemic; healthcare delivery; nursing care coordination; alarm safety for acute and critical care; neonatal monitoring and environmental control; safety-critical mobile work; maritime domain awareness; and military command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR).

RESEARCH FOCUS AND INTERESTS

(A) Empirical science with essential workers, and the people they serve, to discover and describe the non-obvious causes of mission-critical public health problems. This includes emergent new problems created as unintentional side-effects of technological, social, and global change.

- Human-subjects experiments and large-scale field studies to improve external validity of observations;
- Simulation of essential work activities to explore health problems with repeatable controls.
- Multidisciplinary approaches to optimize the utility and scope of observations, including: biomedical informatics, physiology, healthcare delivery, medicine, metacognition, psychology, cognitive psychology, industrial psychology, social psychology, communications, linguistics, human factors, and others.

(B) Digital health technology R&D to create intelligent innovations with high-potential for large-scale positive impact on safety-critical problems, and business successes.

- Machine learning (ML) and signal processing for exploration of health big data and creation of predictive algorithms to aid public health operational decision-making.
- Flexible informatics for end-user development of intelligent agents to defeat information overload.
- Biotelemetry from medical devices and wearables for real-time AI-based decision-aids.
- Interactive multi-media, including: cave virtual reality (VR), projector-camera systems, and wearables.
- Digital therapeutics for rehabilitation.
- Novel technologies for collection of health data, including wearables and passive imaging.

(C) Systems R&D to facilitate technology transition of innovative multidisciplinary solutions into successful fielded business products.

- Flexible real-time AI model implementation and integration.
- Scalable cognitive systems approaches, methods, and technologies.
- Real-time systems: requirements, design, architecture, and prototyping.
- AI platform innovations for safety-critical applications.
- Explainable AI to maximize adoption by essential workers.
- Integration of iterative prototypes into real-world settings for field trials and demonstrations.

PROFESSIONAL COMPETENCIES

Breakthrough science of human infection

Developing, managing, and leading large cross-

Wearable systems for predictive health monitoring	organizational R&D teams
Applied cognitive systems R&D	Leading ideation for invention and innovation
Big data science, and information visualization	Intellectual property and contracts
AI system integration and architectures	Technology transfer into mission-critical products
Safety-critical decision-support systems	Data privacy and information security
Foundational science on human interruption	Proposal writing and capture management
Metacognitive decision-aids for alarm safety	Project financing
Flexible human-in-the-loop informatics	Communications with diverse stake-holders, including sponsors and executives
End-user development for custom intelligent services	Clinical trials & human-subjects experiments
Advanced interactive multi-media systems	Clinical experiments in patient simulation
Applied AI & ML algorithms and platforms	Program management
Contactless physiological monitoring at range	Co-creation with customers and users
Human-systems integration	Customer relations
Edge-computing for env./context monitoring	Workflow analysis Essential personnel activities and workflows
Healthcare delivery systems and services	Business analysis and model development
Military combat systems	
Real-time AI using telemetry and biotelemetry	
Rapid prototyping & formative design studies	

EDUCATION

George Washington University (GWU), Sc.D. (1998), Computer Science

Emphasis: Computer Graphics and Multimedia Systems

Secondary emphases: Human-Computer Interaction; Machine Learning; Computer-Assisted Instruction

Dissertation: "Interruption of People in Human-Computer Interaction"

Committee: Dr. John L. Sibert (chair, GWU), Dr. James A. Ballas (Naval Research Laboratory), Dr. Rachelle Silverman Heller (GWU), Dr. Robert J. K. Jacob (Tufts University), Dr. Carol Dianne Martin (GWU)

University of Oregon, M.S. (1990), Computer Science

Emphasis: Artificial Intelligence

Secondary Emphasis: Software Engineering

Project: System Design Simulation Tool (Petri-Nets; developed in Smalltalk)

Cornell University, B.S. (1987, Honors and Distinction), Communications

Emphasis: Interpersonal Communications

Secondary Emphases: Software Engineering, Computer-Assisted Instruction

Independent Honors Thesis: "Metacognitive Dysfunction of Traumatically Brain Injured People and their Language Problem of Uncoordinated Discourse"

PROFESSIONAL EXPERIENCE

TREFOIL INCORPORATED, A Skunkwork-style private digital innovation lab, Salt Lake City, UT

Founder & CEO (3 years), July 2023 – present

Define, organize, provision, and lead innovation projects to solve important safety-critical problems with "new-to-the-world" groundbreaking AI innovations for important and serious safety-critical problems.

- Current project: <Confidential> High-value, high-potential, AI-augmented interdisciplinary breakthrough to dramatically increase profits for organizations that deploy essential workers. Progress-to-date (completed): special ideation context; empirical investigations; special insights; requirements

documents; interdisciplinary ideation; invention and innovation; system and software design documentation; two fully working prototypes (both hardware and software); and successful testing.

In-progress: submitting US Patent Office applications for a coordinated set of patents.

PHILIPS HEALTHCARE, Philips Research North America, Connected Care & Personal Health, Cambridge, MA

Group Leader & Principal Scientist (3.5 years), January 2020 – June 2023

Led and managed a research group (12-17 people) to innovate clinical informatics S&T creating valuable discriminators for Philips core products and services. Worked across business groups to cause meaningful innovation. Secured external funding to enable 'Innovation to Market' (I2M) acceleration to solve key customer needs.

- RATE-COVID (US DTRA/DIU/DARPA, 2020-2021, \$15.2M), led a multi-organization team to develop/deploy an application of the Philips RATE algorithm (early warning of pre-symptomatic infection) using consumer common-off-the-shelf (COTS) wearables to address the COVID-19 pandemic for US Military and the VA Hospital; Partners include: Texas A&M U., VA Hospital, Palo Alto, CA, and PAVIR; Overall lead, co-PI, PM;
- Persistent Readiness through Early Prediction (PREP; US DTRA, 2021-2024, \$15.3M), led a multi-organization team to improve the Philips RATE algorithm with actionable information; Partners included: Texas A&M U.; Overall lead, co-PI, PM.
- Notification of Toxic Exposure (NOTE, US DTRA/DIU, 2020-2022, \$5M), led a multi-organization team to develop a predictive algorithm for use on wearables for early warning of pre-symptomatic exposure to HAZMATS (opioids, organophosphates, mustard agents); Partners include: Texas A&M U., Dexcom Inc., and Medical College of Georgia at Augusta University; Overall lead, co-PI, PM;
- Secured CR&D and led performance on multiple advanced development projects for prototype applications and maturation of RATE, including: RATE-Ship (DTRA, 2020, with RATE-COVID); RATE-Tracker (JPEO, 2021, \$440K); RATE-Smartabase (AFRL, 2022, \$880K); the PREP Consideration task (DTRA, 2022, with PREP); and RATE Activate (JPEO, 2024-2028, \$24M [note, I left RATE Activate after winning the funding, and did not lead performance on the project]).
- Monitoring Exposure through Standoff Health (MESH, DTRA, 2021-2022, \$400K), led a multi-organization team to explore novel technologies for contactless physiological monitoring at >100 meters; Partners include: Charles River Analytics (CRA); Proposal lead, co-PI, PM;

PHILIPS HEALTHCARE, Philips Research North America, Acute Care Solutions, Cambridge, MA

Principal Scientist (1.7 years), May 2018 – December 2019

Led innovative clinical informatics S&T to create valuable discriminators for Philips core products and services. Worked across business groups to cause meaningful innovation. Secured external funding to enable 'Innovation to Market' (I2M) acceleration to solve key customer needs.

- Rapid Analysis of Threat Exposure (RATE; US DIU/DTRA, 2018-2019 \$1.8M), predictive monitoring to improve military force readiness through pre-symptomatic early warning of exposure to infectious agents, PM, co-PI;
- Sensor Bar V.2: Philips' first general clinical systems integration platform; led design and development of Version 2, inventor/PI;
- Acting Group Leader for the ACS AI Lab (Sept. 2018 – Nov. 2018) during reorganization.

PHILIPS HEALTHCARE, Patient Care & Monitoring Solutions (PCMS) / Monitoring Analytics & Therapeutic Care (MA&TC), CMIO Office, Clinical Science & Innovation, Andover, MA

Principal Research Scientist (4.1 years), April 2014 – May 2018

Led visionary clinical informatics S&T to create valuable discriminators for Philips core products and services. Worked across business groups to cause meaningful innovation. Secured funding and led wearable technologies to defeat information overload for clinical users.

- Sensor Bar V.1: Philips' first general clinical systems integration platform; led design and development of Version 1, integrate with LOTUS, deployed above 51 NICU beds for clinical experiment, inventor/PI;
- CDMA (US OASD(R&E), \$650K), wearable metacognitive aid for nurse triage of alarms, PM/PI;
- Wearable surveillance rapid co-creation (WS-RCC), service track co-lead, led requirements gathering and documentation, including customer interviewing (a "voice-of-the-customer" (VoC) activity);
- AAMI Healthcare Tech. Safety Institute (AAMI HTSI), Alarm Safety Steering; Systems Advisory.
- Temporary work transfer (summer 2016) Philips Research, Patient Care and Measurements (PC&M), collaboration between business and research, High Tech Campus, Eindhoven, the Netherlands.

LOCKHEED MARTIN ADVANCED TECHNOLOGY LABS, Informatics Lab, Arlington, VA

LM Fellow and Principal Research Engineer (4.3 years), January 2010 – April 2014

Led visionary S&T that improved the competitiveness of LM core products. Worked across organizations and collaborated with US Govt. S&T sponsors to articulate and prioritize S&T priorities. Secured funding and implemented methods and metrics to coordinate R&D and manage progress.

- JOIN: Mixed-Initiative Discovery in Big-Data (LM, \$450K), flexible large-scale data analytics, PI/PM;
- LM Fellows Action Team on Technology Transition, Lead; ATTEND innovation process, author;
- INSIGHT (DARPA, \$11M), Evaluation IPT Lead, Field Test 1, streaming multi-source sensor data;
- Supervision of UxV Mission Management by Interactive Teams (ONR \$5M) Steering Committee Chair;
- Collaboration Associate for Software Integration, (LM, \$1.3M), large-scale organizational data, PI/PM.
- NETCENTS-2 App. Services & Netcentric Ops. (USAF, IDIQ \$1B+\$7.5B), Lead Author, tech approach.

LOCKHEED MARTIN ADVANCED TECHNOLOGY LABS, Artificial Intelligence Lab, Cherry Hill, NJ

Principal Member Engineering Staff (4.3 years), September 2005 – January 2010

Led visionary S&T to improve the competitiveness of LM core products. Worked across LM to articulate and prioritize S&T priorities. Collaborated with S&T sponsors to conceptualize, secure funding, and perform R&D that positively impacted national security. Led multi-organization research teams.

- Interactive Dirt, wearable projector-camera system (LM seedling), mobile collaboration, PI/PM;
- Suspicion Vessel Focuser, flexible risk assessment (DARPA, LM, \$1.2M), streaming AIS data, PI/PM;
- Integrated Learning (DARPA, \$20M), federated machine learning, Evaluation Lead;
- Fast Connectivity for Coalitions and Agents, flexible monitoring (DARPA, \$5M), UI and Eval. Lead;
- Intelligent Entity Architecture, motivation-based hybrid AI architecture (LM, \$250K), PI/PM.

LOCKHEED MARTIN ADVANCED TECHNOLOGY LABS, Artificial Intelligence Lab, Camden, NJ

Senior Member Engineering Staff (5.6 years), January 2000 – September 2005

Collaborated with S&T sponsors and other stakeholders to conceptualize, secure funding, and perform informatics R&D projects that positively impacted national security. Led multi-organization research teams as principal investigator, program manager, and/or integrated product team leader.

- Human Alerting and Interruption Logistics – Surface Ship, alarm/alert mediation (ONR \$3.5M), PI/PM;
- Integrated Battle Command (DARPA \$3M), command and control, User Interface IPT Lead;
- Augmented Cognition (DARPA, \$5.5M), biometrics sensor data, Seedling Capture Manager (\$500K);

US NAVAL RESEARCH LAB, Navy Center for Applied Research in Artificial Intelligence, Interface Design and Evaluation Section, Washington, DC

Lead Research Scientist & Thomas Edison Fellow (4.3 years), October 1995 – January 2000

Led visionary S&T that addressed US Navy C4ISR future capability shortfalls. Worked across NRL and other US Navy labs to shape S&T approaches and perspectives. Collaborated with S&T sponsors to secure funding, and perform decision-support R&D. Developed cognitive systems research prototypes. Conducted human-subjects experiments.

- Human Alerting and Interruption Logistics (HAIL), foundational, multi-disciplinary, basic research on human interruption for human-systems integration (ONR and NRL), PI/PM;
- Hierarchical Interactive Case-Based Architecture for Planning (ONR, NRL, ARL), co-investigator.
- Basic research of decision-support for US Navy Meteorology and Oceanography (METOC) operations.

US NAVAL RESEARCH LAB, Human-Computer Interaction Lab, Adaptive Interfaces Section, Washington, DC

Research Scientist (5.2 years), August 1990 - October 1995

Contributed to visionary S&T that addressed US Navy C4ISR future capability shortfalls. Worked across NRL and other US Navy labs to shape S&T approaches and perspectives. Collaborated with S&T sponsors to secure funding, and perform decision-support R&D. Developed cognitive systems research prototypes. Conduct human-subjects experiments.

- Interactive Situation Assessment and Roll-up Tool (ISART; ONR and NRL), customizable intelligent C4ISR for naval combat systems, Tech. Lead;
- Integrality and Separability of Input Devices (ONR and NRL), theory-based experimentation with human-subjects regarding user-interface device design/selection, co-investigator.
- Automatic software verification (ONR and NRL), conducted detailed analysis and comparison of the use of multiple software specification languages for automated verification of designs, including: Mode Chart (and its underlying RTL), Vanilla Petri-Nets, Timed Petri-Nets (various Kinds), and E.M. Clarke's version of Temporal Logic.

McFARLANE TIMBER, Philomath, OR

Small Business Owner, 1990 (summer)

Supplier of: forest timber for lumber mills, and firewood for residential use.

UNIVERSITY OF OREGON, Department of Physical Education and Recreation, Eugene, OR

Staff (2 years), 1988-1990

Facility security and first aid.

GAYLORD HOSPITAL, Traumatic Brain Injury Rehabilitation Center, Wallingford, CT

Research Assistant & Software Developer, 1986 & 1987 (summers)

Administered experimental treatments to patient subjects and recorded and transcribed their responses. Designed, implemented, deployed, supported digital therapeutics to aid speech therapy for outpatient rehabilitation.

US SECURITY CLEARANCE

[information available upon request]

FUNDING: EXTRAMURAL CONTRACT R&D, GRANTS & INTERNAL INVESTMENTS (UNCLASSIFIED ONLY)

Summary:

Number of different sponsor organizations: 13

Total number of funded CR&D projects: 32 (18 as overall lead)

Total CR&D funding (not including IDIQ): \$140M (51% as overall lead)

Lead Technology Approach writer for successful IDIQ contracts: \$8.5B

Reverse Chronological List:

["*" indicates overall leadership role; "^" indicates I did not work the project after winning the funding]

*^JPEO, RATE-Activate, 2024-2028, \$24M

^DIU/OUUSD(R&E), RATE APFIT (Accelerate the Procurement and Fielding of Innovative Technologies), 2023-2024, \$10M

*AFRL, RATE-Smartabase, 2022, \$880K

*JPEO, RATE-Tracker, 2021, \$440K

*DTRA, Monitoring Exposure through Standoff Health (MESH), 2021-2022, \$400K

*DTRA/AFRL/DARPA, Persistent Readiness through Early Prediction (PREP), 2020-2023, \$15.5M

*DTRA/DIU/AFRL/DARPA, RATE-COVID, 2020-2021, \$15.2M

*DTRA/DIU, Notification of Toxic Exposure (NOTE), 2020-2022, \$6.5M

*DTRA/DIU, Rapid Analysis of Threat Exposure (RATE), 2018-2019, \$1.8M

*OASD(R&E) Contextual Delivery of Medical Alarms (CDMA), 2013-2015, \$650K

^US Air Force, NETCENTS-2 Application Services, (proposed 2013, awarded 2014) IDIQ total value \$1B

^US Air Force, NETCENTS-2 Netcentric Operations, (proposed 2013, awarded 2015), IDIQ total value \$7.5B

*LM JOIN: Mixed-Initiative Discovery in Big Data, 2011-2012, \$440K

DARPA INSIGHT, 2011 – 2012, \$11M

ONR Supervision of UxV Mission Management by Interactive Teams (SUMMIT), 2008 – 2010, \$5M

*LM Ask Me Anything, 2009, \$200K

*LM Interactive Dirt, 2009, \$35K

*LM Composable Command and Control, 2008, \$150K

DARPA Integrated Learning, 2006-2008, \$20M

*LM Collaboration Associate for Software Integration (CASI), 2005 – 2010 (multiple), \$1M

DARPA Integrated Battle Command (IBC), 2005-2006, \$3M

*LM Intelligent Entity Architecture (IEA), 2005, \$250K

DARPA Fast Connectivity for Coalitions and Agents (FastC2AP), 2004 - 2007, \$5M

DDG-1000 Ship Resource Model, 2004 - 2006, \$1.2M

DARPA Joint Air/Ground Operations Unified, Adaptive Replanning (JAGUAR), 2003 - 2007, \$8M

*ONR Future Naval Capabilities, Human Alerting and Interruption Logistics – Surface Ship (HAIL-SS), 2002 - 2004, \$3.5M

DARPA Augmented Cognition (AugCog), 2001 - 2004, \$5M

*^DARPA Augmented Cognition (AugCog) seedling, 2001, \$500K

*ONR Interruption and Alerting Management with Context, 2000, \$27K

Office of Naval Research 6.1 Funding, 10/1996 - 9/1997.

*George Washington University GWU Research Grant, 4/1998 - 5/1998.

Office of Naval Research and Naval Research Laboratory 6.2 Funding 10/1995 - 9/1998.

TECHNOLOGY TRANSFER HIGHLIGHTS

Rapid Analysis of Threat Exposure (RATE, 2018-2023): A portfolio of early-warning solutions for managing workforce readiness during health threats; Roles: overall lead, capture manager, co-Principal Investigator, program manager;

- Algorithms and system for near real-time, early-warning, pre-symptomatic prediction of exposure to health threats (e.g., infectious agents or hazardous chemicals) that impact workforce readiness.

Uses streaming biotelemetry from COTS wearables and/or medical devices. Delivers about two days pre-symptomatic early-warning for COVID-19 infection.

- Led a large cross-organization team (~42 professionals) through every aspect of this key innovation, including: securing funding; foundational basic research; technical operationalization; advanced development; field study (IRB led by AFRL) with >13K operational US military service members across >12 sites; prospective clinical experiments with human-subjects; and productization.
- Won a portfolio of US Department of Defense (DoD) CR&D investments totaling \$75M (sponsors: DTRA, DIU, DARPA, AFRL and JPEO). In mid-2023 RATE was about half-way through preparing for acquisition by a US DoD Program of Record for wearables. Versions have been created for both hospital clinical environments with medical devices and for mobile workers with COTS wearables.
- Technical Innovations: a suite of novel AI/ML algorithms from health big data bioinformatics analysis, and an innovative system platform;

Sensor Bar (2017-present): A patented device innovation that combines advanced environmental and context sensing with a flexible large-scale real-time AI processing platform; Roles: overall lead, inventor, principal investigator, program manager;

- Technical Innovations: A novel scalable edge-compute AI platform.
- S&T Contracts: <not included here for commercial sensitivity>.
- Production host product: Commercial healthcare clinical environments.
- Technology Transition Status: investigational prototypes (51 units) field-deployed for clinical experiment ceiling-mounted above neonatal intensive care unit (NICU) beds in two US hospitals for >12 months; integrated into hospital networks; included within new commercial NICU solution (production currently on hold).

Supervision of UxV [unmanned expeditionary vehicles] Mission Management by Interactive Teams

(SUMMIT, 2008-2014): A team-centric command and control system enabling operators to collaboratively share tasking for a suite of mission applications including multiple unmanned vehicles;

Role: Steering Committee Chairman;

- Technical Innovations: A novel flexible system architecture; collaborative user interface; proxy-based integration interfaces for unmanned systems.
- S&T Contracts: \$5M.
- Production Host Product: US Navy Littoral Combat Ship (LCS) Mine Counter-Measures (MCM) Mission Package; SUMMIT is an upgrade of the MCM package for LCS.
- Technology Transition Status: Formally acquired by the LCS Program Office; successful field-tests with "live" unmanned vehicles in 2011; actively tested for inclusion within the first MCM Mission Package deployment.

Collaboration Associate for Software Integration (CASI, 2005 – 2014): High-precision, on-premises, organization search to enable very large teams to gain near-instant access to organizational knowledge and to automatically identify human experts; Roles: Inventor, Principal Investigator, Program Manager;

- Technical Innovations: A novel fully automated metadata population service; metadata context engine; expertise estimation algorithm; scalable context-based search algorithm; novel on-premises network security model.
- S&T internal investment: \$1M.
- Production host product: Stand-alone product; deployed for use by multiple large program engineering teams within Lockheed Martin production businesses; documented increase in large group collaborative performance for multiple \$B programs.

- Technology transition status: Fully successful; deployed in 6 separate corporate on-premises installations (the first in Aug. 2008); ~10 thousand total users.

Suspicion Vessel Focuser (SVF, 2006 – 2014): Flexible threat assessment to enable a team of front-line operators & analysts to each get custom real-time analyses of big data and alerting; Roles: Inventor, Principal Investigator, Program Manager;

- Technical Innovations: A novel end-user development; scalable and flexible AI machine reasoning platform; unique web-based user-interface; domain-independent information focuser engine.
- S&T internal investment: \$1.2M.
- Production Host Product: The Lockheed Martin, Maritime Integrated Domain Awareness Solution (MIDAS) Product.
- Technology Transition Status: Successful transition into the MIDAS product; favorably reviewed by the US Navy in multiple field-experiments, 2006 – 2008, at 6th and 3rd Fleets.

Human Alerting and Interruption Logistics (HAIL, 2002 - 2005): A system to enable alarm safety for essential workers by preventing information overload; Roles: overall lead, IP owner, capture manager, principal investigator, program manager;

- Interactive decision-support services for alert/alarm management to enable operators to deal with high rates of alerting without degrading performance on primary work;
- Led a large cross-organization team (>35 professionals) through every aspect of this key innovation, including: securing funding, foundational basic research, technical operationalization, advanced development, productization, integration with AEGIS, field evaluation, and transfer into the AEGIS Program of Record for every Combat Information Center (CIC) console.
- Technical Innovations: A novel cognitive system with a suite of negotiation-based metacognitive coordination services; domain-independent alert mediation engine; flexible system architecture
- S&T Contracts: \$3.5M
- Production Host Product: US Navy AEGIS Program [note: HAIL is a key upgrade for \$B warships]
- Technology transfer status: Fully successful; deployed for use on every operator console on all ~110 ships; first commissioned ship with HAIL: USS Sterett, DDG-104, Aug., 2008; also transitioned into the US Coast Guard National Security Cutter Program, and others.

PUBLICATIONS

Refereed Journal Stand-Alone Issue

McFarlane, D.C., & Latorella, K. A. (2002) The scope and importance of human interruption in HCI design. *Human-Computer Interaction*, 17, 1–61.

<https://www.tandfonline.com/toc/hhci20/17/1?nav=tocList> ,
https://doi.org/10.1207/S15327051HCI1701_1

McFarlane, D.C. (2002) Comparison of four primary methods for coordinating the interruption of people in human-computer interaction, *Human-Computer Interaction*, 17, 63–139.

<https://www.tandfonline.com/toc/hhci20/17/1?nav=tocList> ,
https://doi.org/10.1207/S15327051HCI1701_2

Refereed Journal Articles

Feng, Ting, Mariani, Sara, Conroy, Bryan, Damiano, Robert, Silva, Ikaro, Swearingen, Dennis, McFarlane, Daniel C. (2025) An infection prediction model developed from inpatient data can predict out-of-hospital COVID-19 infections from wearable data when controlled for dataset shift, *Sci Rep* 15, 33367 (2025). <https://doi.org/10.1038/s41598-025-17593-y>

- Wang, Chunxue, Mariani, Sara, Damiano, Robert J., Lajevardi-Khosh, Arad, Silva, Ikaro, Ruebush, Laura, McFarlane, Daniel C., Deutz, Nicolaas, Conroy, Bryan. (2025). Wearable-derived short sleep duration is associated with higher C-reactive protein in a placebo-controlled vaccine trial among young adults. *Sci Rep* 15, 10501 (2025). 10.1038/s41598-025-94816-2.
- Wang, Chunxue, Damiano, Robert J., Ruebush, Laura E., Engelen, Mariëlle P. K. J., Mariani, Sara, Liu, Luoluo Borhani, Soheil, Cote, Gerard L., McFarlane, Daniel C., Deutz, Nicolaas E. P. (2024) A randomized, triple-blinded, placebo-controlled clinical trial evaluating immune responses of Typhim Vi and PPSV23 vaccines in healthy adults: the PREP study, *Vaccine* 42(26):126292, DOI:10.1016/j.vaccine.2024.126292.
- Feng, Ting, Noren, David P., Kulkarni, Chaitanya, Mariani, Sara, Zhao, Claire, Ghosh, Erina, Swearingen, Dennis, Frassica, Joseph, McFarlane, Daniel, and Conroy, Bryan, (2023) Machine learning-based clinical decision support for infection risk prediction. *Front. Med.* 10:1213411, Sec. Precision Medicine, Volume 10 – 2023, <https://doi.org/10.3389/fmed.2023.1213411>
- Conroy, B., Silva, I., Mehraei, G., Damiano, R., Gross, B., Salvati, E., Feng, T., Schneider, J., Olson, N., Rizzo, A.G., Curtin, C.M., Frassica, J. & McFarlane, D.C., Real-time infection prediction with wearable physiological monitoring and AI to aid military workforce readiness during COVID-19. *Sci Rep* 12(1):3797 (2022). <https://www.nature.com/articles/s41598-022-07764-6> , <https://doi.org/10.1038/s41598-022-07764-6>
- McFarlane DC, Doig AK, Agutter JA, Brewer LM, Syroid ND, Mittu R (2018) Faster clinical response to the onset of adverse events: A wearable metacognitive attention aid for nurse triage of clinical alarms. *PLoS ONE* 13(5): e0197157. <https://doi.org/10.1371/journal.pone.0197157>
- McFarlane, DC, Doig, AK, Agutter, JA, Mercurio, JL, Mittu, R, Brewer, LM, & Syroid, ND (2016) Defeating information overload in health surveillance using a metacognitive aid innovation from military combat systems, *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, DOI: 10.1177/1548512916667246, dms.sagepub.com, <http://dms.sagepub.com/content/early/2016/09/09/1548512916667246?papetoc>
- McFarlane, D. C. (2014) A Scare in the OR Highlights Value of System Engineering, *AAMI Horizons, Biomedical Instrumentation & Technology: Connecting the Dots*, Vol. 48, No. s2, pp. 44-50, doi: <http://dx.doi.org/10.2345/0899-8205-48.s2.44>.
- Allen, Julie Scott, & McFarlane, Daniel C. (2014) Healthcare Alarm Safety—What We Can Learn From Military Alarm Management Strategies, *Safety Innovation Series*, Association for the Advancement of Medical Instrumentation (AAMI) Foundation, Healthcare Technology Safety Institute (HTSI), pp. 1-8; *Biomedical Instrumentation & Technology*, May/June 2014, pp. 180-184. https://www.aami.org/docs/default-source/foundation/alarms/2014_si_alarm_safety_lockheed_martin.pdf?sfvrsn=4a64e69e_2
- Xiaoqin Shelley Zhang, Bhavesh Shrestha, Sungwook Yoon, Subbarao Kambhampati, Phillip Dibona, Jinhong K. Guo, Daniel McFarlane, Martin O. Hofmann, Kenneth Whitebread, Darren Scott Appling, Elizabeth T. Whitaker, Ethan B. Trehitt, Li Ding, James R. Michaelis, Deborah L. McGuinness, James A. Hendler, Janardhan Rao Doppa, Charles Parker, Thomas G. Dietterich, Prasad Tadepalli, Weng-Keen Wong, Derek Green, Anton Rebguns, Diana Spears, Ugur Kuter, Geoff Levine, Gerald Dejong, Reid L. Mactavish, Santiago Ontañón, Jainarayan Radhakrishnan, Ashwin Ram, Hala Mostafa, Huzaifa Zafar, Chongjie Zhang, Daniel Corkill, Victor Lesser, & Zhexuan Song (2012) An Ensemble Architecture for Learning Complex Problem-Solving Techniques from Demonstration, *ACM Transactions on Intelligent Systems and Technology*, Vol. 3, No. 4, Article 75, ACM, New York. <https://doi.org/10.1145/2337542.2337560>
- Kushnier, S. D., Heithecker, C. H., Ballas, J. A., & McFarlane, D. C. (1996). Situation Assessment Through Collaborative Human-Computer Interaction. *Naval Engineers Journal*, 108(4), 41-51. <https://doi.org/10.1111/j.1559-3584.1996.tb02894.x>

Jacob, R. J. K., Sibert, L. E., McFarlane, D. C., & Mullen, M. P., Jr. (1994). Integrality and Separability of Input Devices. *ACM Transactions on Computer-Human Interaction*, 1(1), 3-26. <https://doi.org/10.1145/174630.174631>

Refereed Journal Articles – Accepted for Publication, Awaiting Release

Refereed Journal Articles – Submitted, Awaiting Review

Book Chapter

McFarlane D. C. (2006) Engaging Innate Human Cognitive Capabilities to coordinate Human Interruption: The HAIL System, in C. Gorsythe, M. L. Bernard, & T. E. Goldsmith (Eds.) *Cognitive Systems: Human Cognitive Models in Systems Design*, Lawrence Erlbaum Associated, pp. 137-152, ISBN 9781410617088.

Monograph Chapter

Masys, Daniel R., Hines, J. Wesley, Saleem, Jason J., Roth, Emilie M., McFarlane, Daniel C., & Agarwal, Vivek (2013) Diagnosis and Prognosis: Approaches to Problem Identification and Prediction in Healthcare and Nuclear Power (Chapter 5), pg. 27-35, in AAMI Monograph, Risk and Reliability In Healthcare and Nuclear Power Learning from Each Other, editors, Weinger, Matthew B., Hallbert, Bruce P., & Logan, Mary K., The Association for the Advancement of Medical Instrumentation (AAMI), www.aami.org, ISBN 1-57020-488-8.

Doctoral Dissertation

McFarlane, D. C. (1998). Interruption of People in Human-Computer Interaction. Doctoral Dissertation, George Washington University, Washington, DC, 308 pgs.

Video

McFarlane, D.C. (2013) "JOIN, the Mechanization of Attention: Enabling Discovery of Unknowns in Big Data – 9 Terabytes in 99 Seconds."

Refereed Conference Papers

McFarlane, D., Conroy, B., Noren D., Silva, I., Feng, T., Damiano, R., Salvati, E., Mariani, S., Rock, J., Liu, L., Miran, S., Goudarzi, M.M., Wang, T. & Lajevardi-Khosh, A. (2022), Assessing Workforce Readiness through Wearable Physiological Monitoring and Predictive Models of Infection and Chemical Exposure, Chemical and Biological Defense Science & Technology Conference (CBD S&T), Session: Harnessing Physiological Data for Early Warning of Threat Exposure, December 6-9, 2022, San Francisco, CA.

Feng, Ting, Conroy, Bryan, Noren, David, Kulkarni, Chaitanya, Gosh, Erina, Zhao, Claire, Sorower, Shahed and McFarlane, Daniel, (2020) 610: Predicting Infection Type upon Clinical Suspicion of Hospital-Acquired Infection, *Critical Care Medicine* 48(1):285, DOI:10.1097/01.ccm.0000626180.94810.ec

Conroy, Bryan, & McFarlane, Daniel, (2019) Pre-symptomatic Predictive Models of Infection Exposure, Chemical and Biological Defense Science & Technology Conference, Defense Threat Reduction Agency, Cincinnati, OH, November 18-21, 2019.

McFarlane, Daniel C. & Doig, Alexa K., (2019), Large scale patient simulation for improved science on patient safety, AAMI Exchange 2019, Association for the Advancement of Medical Instrumentation, Cleveland, OH, USA, 6-9 June, 2019.

McFarlane, Daniel C., Doig, Alexa K., Agutter, James A., Mercurio, Jonathan L., Mittu, Ranjeev, Brewer, Lara M., Syroid, Noah D. (2016) Leveraging Healthcare Training Infrastructures for Human Factors

- Assessment of Prototype Medical Devices, Department of Defense, Human Factors Engineering, Technical Advisory Group, Meeting 70, NASA Langley Research Center, Hampton, VA, 9-13, 2016.
- McFarlane, Daniel C., Doig, Alexa K., Agutter, James A., Mercurio, Jonathan L., Mittu, Ranjeev, Brewer, Lara M., Syroid, Noah D. (2016) Defeating Information Overload in Health Surveillance using a Metacognitive Aid Innovation from Military Combat Systems, Texas FreshAIR Big Data & Data Analytics Conference, University of Texas System, San Antonio, TX, 30-31 March, 2016.
- McFarlane, Daniel C., Doig, Alexa K., Agutter, James A., Mercurio, Jonathan L., Mittu, Ranjeev, Brewer, Lara M., Syroid, Noah D. (2015) Defeating Information Overload in Health Surveillance using a Metacognitive Aid Innovation from Military Combat Systems, NATO Science & Technology Organization, HFM-254 Symposium on "Health Surveillance and Informatics in Missions," Paris, France, 12-14 October, 2015.
- Eaton, E., Holness, G., & McFarlane, D. C. (2010) Interactive Learning using Manifold Geometry. In *Proceedings of the Twenty-Fourth AAAI Conference on Artificial Intelligence (AAAI-10)*, 24(1):437-443, Atlanta, Georgia, USA, July 11-15, 2010, DOI:10.1609/aaai.v24i1.7688.
- McFarlane, D. C., & Wilder, S. M. (2009) Interactive Dirt: Increasing Mobile Work Performance with a Wearable Projector-Camera System, *Ubiquitous Computing (UBICOMP 2009)*, ACM, pp. 205-214.
- Xiaoqin (Shelly) Zhang, Sungwook Yoon, Phillip DiBona, Darren Scott Appling, Li Ding, Janardhan Rao Doppa, Derek Green, Jinhong K. Guo, Ugur Kuter, Geoff Levine, Reid L. MacTavish, Daniel McFarlane, James R. Michaelis, Hala Mostafa, Santiago Ontanon, Charles Parker, Jainarayan Radhakrishnan, Anton Rebguns, Bhavesh Shrestha, Zhexuan Song, Ethan B. Trehwhitt, Huzaifa Zafar, Chongjie Zhang, Daniel Corkill, Gerald DeJong, Thomas G. Dietterich, Subbarao Kambhampati, Victor Lesser, Deborah L. McGuinness, Ashwin Ram, Diana Spears, Prasad Tadepalli, Elizabeth T. Whitaker, Weng-Keen Wong, James A. Hendler, Martin Hofmann, Kenneth Whitebread (2009) An Ensemble Learning and Problem Solving Architecture for Airspace Management, *International Joint Conference on Artificial Intelligence (IJCAI-09)*, Pasadena, CA, July 14-17, 2009.
- Brock, D., Ballas, J. A. & McFarlane, D. C. (2005) Encoding Urgency in Legacy Audio Alerting Systems, *Proceedings of ICAD 05-Eleventh Meeting of the International Conference on Auditory Display*, Limerick, Ireland, July 6-9, 190-197.
- McFarlane, D.C. & Berger P. (2004) The HSI Implications of a New Naval Combat System Alerting Technology Based on Negotiation-Based Coordination: The HAIL Technology, *TTCP HUM TP-9 Human Systems Integration Workshop*, Ottawa, Ontario, Canada, May 17-18.
- McFarlane, D.C. (2003) Engaging Innate Human Cognitive Capabilities to Coordinate Human Interruption in Computer Interaction: The HAIL System, *Cognitive Systems: Human Cognitive Models in System Design*, Santa Fe, New Mexico, July 2003.
- Franke, J., Daniels, J., and McFarlane, D.C. (2002) Recovering Context After Interruption, *24th Annual Meeting of the Cognitive Science Society*, Fairfax, VA, August 8-10.
- Bell, B. & McFarlane, D. (2001) Enhancing Crew Coordination with Intent Inference, *AAAI Fall Symposium on Intent Inference for Collaborative Tasks*, November 2-4, 2001, North Falmouth, Massachusetts, ISBN 1-57735-143-6
- McFarlane, D. C. (1999). Coordinating the Interruption of People in Human-Computer Interaction, *Human-Computer Interaction - INTERACT'99*, Edinburgh, England, in Sasse, M. A. & Johnson, C. (Editors), Published by IOS Press, Inc., The Netherlands, IFIP TC.13, 295-303.
- Muñoz-Avila, H., McFarlane, D. C., Aha, D. W., Breslow, L., Ballas, J. A., & Nau, D. S. (1999). Using Guidelines to Constrain Interactive Case-Based HTN Planning. *Proceedings of ICCBR'99: The Third International Conference on Case-Based Reasoning* (pp. 288-302). Munich, Germany: Springer.
- McFarlane, D. C. (1998) Interruption of Human Decision Makers During Human-Computer Interaction, *IET-21 (Leveraging Intelligent and Emerging Technology to Support 21st Century Leaders)*, July 23, 1998, National Defense University, Fort Lesley J. McNair, Washington, DC.

Conference Exhibits

- Sara Mariani, S., Silva, I., Damiano, R., Schulman, D. & McFarlane, D. (2022) Monitoring Exposure through Standoff Health: A feasibility study on contactless monitoring at range using off-the-shelf devices (poster), Chemical and Biological Defense Science & Technology conference (CBD S&T), December 6-9, 2022, San Francisco, CA.
- Noren, D., Miran, S., Liu, L., Mariani, S., Gonzalez, E., Chiu, J., Kocmoud, C., Biggers, K., Shainsky, V., Kuchinski, A.M., Rutland, J., Boomer, H., Lyon, M., Gross, B., Frassica, J., Cote, G., Schwartz, R. & McFarlane, D. (2022) Developing Predictive Models of Chemical Hazard Exposure with Hospital Data: A Case Study using Opioid Treatment (poster), Chemical and Biological Defense Science & Technology conference (CBD S&T), December 6-9, 2022, San Francisco, CA.
- McFarlane, D. C. (2014) Leveraging Military Alarm Safety Solutions to Improve Alarm Safety for Health Care (poster), HFES International Symposium on Human Factors and Ergonomics in Health Care: Leading The Way, March 16–19, Chicago, Illinois.
- McFarlane, D. C. & Ballas, J. (1997) Intelligent Control Interface Design, *Software Technology Conference*, ONR Exhibit Booth, Salt Lake City, UT, April 28 - May 1, 1997.
- McFarlane, D. C. (1998) Interruption During Decision Making, *IET-21, Leveraging Intelligent and Emerging Technology to Support 21st Century Leaders*, July 22, 1998, National Defense University, Fort Lesley J. McNair, Washington, DC.
- McFarlane, D. C. (1999) HAIL Project: Human Alerting and Interruption Logistics, *DoD HFE TAG-42 Idea Fair, Department of Defense Human Factors Engineering Technical Advisory Group Meeting 42*, May 10, 1999, Alexandria, VA.

Peer-Reviewed Formal Technical Reports

- Eric Eaton, Dan McFarlane, and Martin Hofmann. Analysis of Complex Data Using Heterogeneous Relational Models. Technical Report #DS-104-421-1610WP, Lockheed Martin Advanced Technology Laboratories, 6 pgs, March 2009.
- Eric Eaton, Gary Holness, and Dan McFarlane. Situational Awareness through Interactive Learning. Technical Report #DS-104-421-1607WP, Lockheed Martin Advanced Technology Laboratories, 4 pgs, March 2009.
- Meghann Lomas, Daniel McFarlane, Eric Eaton, Robert Szczerba, and Jerry Franke. Dynamic Ensemble Planning for Tactical Hierarchies. Technical Report #DS-104-421-1604WP, Lockheed Martin Advanced Technology Laboratories, 4 pgs, March 2009.
- McFarlane, Daniel, Sidharta, Brian, Mendenhall, Henry, & Orr, Mike (2001) Exploration of Machine Learning Technology for Agent-Based Web Scraping of Dynamically-Changing Web Sources, Lockheed Martin Proprietary Information, Lockheed Martin Advanced Technology Laboratories Technical Report, TR-01-04.
- McFarlane, D. C. (1997). Interruption of People in Human-Computer Interaction: A General Unifying Definition of Human Interruption and Taxonomy (NRL Formal Report NRL/FR/5510-97-9870): Naval Research Laboratory, Washington, DC.
- Ballas, J. A., McFarlane, D. C., Achille, L. B., Stroup, J. L., Heithecker, C. H., & Kushiner, S. D. (1996). Interfaces for Intelligent Control of Data Fusion Processing (NRL/FR/5513--96-9806): Naval Research Laboratory, Washington, DC.
- McFarlane, D. C. & Labaw, B. (1991) Specification of Timing Problems of HLCS System, Preliminary Report, NRL Technical Memorandum.

Press Releases and News Articles

Unprecedented Challenges Require Dynamic Solutions (January 09, 2023) regarding PREP collaboration with TAMU,

https://www.realclearpolicy.com/articles/2023/01/09/unprecedented_challenges_require_dynamic_solutions_874426.html

<https://www.washingtonexaminer.com/restoring-america/courage-strength-optimism/unprecedented-challenges-require-dynamic-solutions>

Time to start operationalizing wearable technology in the DoD (May 31, 2022)

<https://breakingdefense.com/2022/05/time-to-start-operationalizing-wearable-technology-in-the-dod/>

Be Prepared: Machine Learning is Equipping Us for the Unknown (January 12, 2021)

<https://www.dvidshub.net/news/386801/prepared-machine-learning-equipping-us-unknown?/twitter>

U.S. troops test wearables for early detection of COVID-19 (September 27, 2020)

<https://www.freethink.com/health/early-detection-of-covid-19>

The U.S. Department of Defense, Philips Expand Research on Groundbreaking AI Technology, Opening

New Front in Battle to Contain COVID-19 (Sep 22, 2020) <https://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2020/20200922-the-us-department-of-defense-philips-expand-research-on-groundbreaking-ai-technology-opening-new-front-in-battle-to-contain-covid-19.html>

The US Military's Latest Wearables Can Detect Illness Two Days Before You Get Sick (September 22,

2020) <https://www.defenseone.com/technology/2020/09/militarys-latest-wearables-can-detect-illness-two-days-you-get-sick/168664/>

<https://www.defense.gov/News/News-Stories/Article/Article/2356086/ai-aids-dod-in-early-detection-of-covid-19/>

Philips and the U.S. Department of Defense Develop Breakthrough Technology Using AI to Identify Infection More Than 48 Hours Before Observable Symptoms (October 22, 2019)

Businesswire.com, healthcareitnews.com, nexgov.com, usa.philips.com,

<https://www.businesswire.com/news/home/20191022005346/en/Philips-U.S.-Department-Defense-Develop-Breakthrough-Technology>

<https://www.nextgov.com/analytics-data/2019/10/military-algorithm-can-predict-illness-48-hours-symptoms-show/160851/>

<https://www.usa.philips.com/a-w/about/news/archive/standard/news/press/2019/20191022-philips-and-the-us-department-of-defense-develop-breakthrough-technology-using-ai-to-identify-infection-more-than-48-hours-before-observable-symptoms.html>

<https://www.healthcareitnews.com/news/dod-philips-partner-ai-enabled-infection-control>

Navy Warfighter Provides 'Alarms' Lessons for Healthcare (April 2014) AAMI News, 49(4).

In Profile: Fighting Alarm Fatigue on the High Seas And Beyond (August, 2012) AAMI News, 47(8),

Association for the Advancement of Medical Instrumentation,

<http://www.aami.org/publications/AAMINews/Aug2012/inprofile.html>

Early Warning for Maritime Security: Suspicion Vessel Focuser (February 29, 2008) Lockheed Martin Advanced Technology Laboratories TechBriefs 3(2),

http://www.atl.lmco.com/news/techbriefs/techbriefs_SVF.php

Suspicion Vessel Focuser (SVF) Lockheed Martin Advanced Technology Laboratories TransitionBriefs 2(9), http://www.atl.lmco.com/news/transitionbriefs/transitionbriefs_SVF.php

Lockheed Martin Develops Early Warning for Maritime Security (August 12, 2008) Lockheed Martin Advanced Technology Laboratories New Release,

<http://www.atl.lmco.com/news/2008/081208.php>

Fast Connectivity for Coalitions and Agents Program (FastC2AP) Lockheed Martin Advanced Technology Laboratories TransitionBriefs 2(1), http://www.atl.lmco.com/news/tranbriefs/tranbriefs_FAST.php

SoSER'ch: Systems of Systems Engineering Repository: High Precision Search (SoSER'ch) Lockheed Martin Advanced Technology Laboratories TransitionBriefs 3(2), http://www.atl.lmco.com/news/tranbriefs/tranbriefs_SOSER.php

Human Alerting Interruption Logistics (HAIL) Lockheed Martin Advanced Technology Laboratories TransitionBriefs 2(8), http://www.atl.lmco.com/news/tranbriefs/tranbriefs_HAIL_2008.php

[Quoted in] Employees Forsake Dreaded Email For the Beloved Phone (Sept. 26, 2006) The Wall Street Journal, by Jared Sandberg, <http://online.wsj.com/article/SB115923906128273954.html>

Human Alert Technology Ready for Ships: System Will Help Sailors Manage High Rate of Alerts, Interruptions, Lockheed Martin Advanced Technology Laboratories Insights, pg. 34, <http://www.atl.lmco.com/news/techfeatures/Insights4Q08/4Q08Insight1D.php>

Human Alerting Interruption Logistics (HAIL) Lockheed Martin Advanced Technology Laboratories TransitionBriefs 1(6), http://www.atl.lmco.com/news/tranbriefs/tranbriefs_HAIL.php

Workshop Presentations

McFarlane, Daniel C., Mittu, Ranjeev, Barry, Kevin, Amidvar, Andrew (2015) Contextualized Delivery of Medical Alarms (exhibit with demo), Medical S&T Showcase, US Naval Research Laboratory, Washington, DC, 13 April, 2015.

McFarlane, Daniel C. (2011) The field-proven McFarlane ATTEND Process for increasing probability of win through technology transition, *Lockheed Martin Fellows Action Team Workshop, Lockheed Martin Fellows Conference*, Orlando, FL.

McFarlane, Daniel C., (2004) Interruption Scheduling, Time Design Panel, *Human Factors and Ergonomics Society 48th Annual Meeting (HFES'04)*, 9/21/04, New Orleans, LA, 1530-1700.

McFarlane, Daniel C. (1999) Human Alerting and Interruption Logistics (HAIL) Project: Interruption of People in Human-Computer Interaction, Managing Critical Event systems: Attention Management -- Interruptions and Alerts, A Workshop sponsored by the Office of Naval Research, Cognitive and Neural Science and Technology Division, June 2-3, 1999, Arlington, VA.

Ballas, James A., McFarlane, Daniel C., Achille, Lisa B., Stroup, Janet L, Heithecker, Chris H. & Kushnier, Scott D. (1997) Interfaces for Intelligent Control of Data Fusion Processing, US/UK Data Fusion Workshop, Defense Research Agency, Farnborough, England., 12-14 March, 1997.

McFarlane, Daniel C. & Ballas, James A. (1992) *DARPA JSGCC Software Initiative Workshop*, Vail, CO, Dec. 1-4, 1992.

Other Presentations

Lockheed Martin Engineering Process Improvement SSI/SC conference, invited speaker, 4/28/09

ONR's Unmanned Combat Air Vehicle 6.2 Program Workshop, Office of Naval Research, Weapons, Marine Corps, and Special Programs Strike Technology Division, Naval Research Laboratory Dec. 15-17, 1998.

Invited Field Observation

University of Utah Hospital, Salt Lake City, 7/2014, alarm safety.

Cedars-Sinai Medical Center, Los Angeles, CA, 6/3/2013, alarm safety.

Palomar Medical Center, Escondido, CA, 5/31/2013, alarm safety.

DaVita Dialysis Center, Glenn Burnie, MD, 9/20/2012, alarm safety.

Massachusetts General Hospital, Boston, MA, 8/7/2012, alarm safety.

Johns Hopkins Hospital, Baltimore, MD, 7/3/2012, alarm safety.

US Army Ft. Polk, LA, JFTC, 2/4/2010, interactive mobile coordination of call for fire and MEDEVAC

NSWC-PCD/ONR, Panama City, FL, May 2008 Evaluate LCS MCM Mission Package ops., & identify potential tech.
CNE-C6F/DARPA, FastC2ap, Naples, Italy, 3 times, 2005 - 2007 Evaluate NEPOCC TMFC & Intel ops. & identify potential tech. improvements
JFCOM/DARPA IBC, Planning Ex, Suffolk, VA, 3 times, 2005 - 2006 Evaluate JSFHQ planning operations & identify potential tech. improvements
CSEDS/AEGIS, Moorestown, NJ, 2 times, 2000 - 2004 Evaluate AEGIS CIC operations & identify potential tech. improvements
ATRC/AEGIS, Dahlgren, VA, 12 June, 2002 Evaluate AEGIS CIC operations & identify potential tech. improvements
USS Anzio (AEGIS Cruiser), ASCIET War Games (All Service Combat Identification Evaluation Team), Gulfport, Miss, Sept. 13, 1995.
Rome Laboratory Demonstrations, demonstrations of ARPA-funded research at the MIT Media Laboratory, Cambridge, MA, May 25 & 26, 1994. First author of a formal NRL Trip Report co-authored with James Hofmann titled, "1994 MIT Media Laboratory Technology Demonstrations."

Invited Seminar Presentations

ONR Netcentric Seminar Series, Washington, DC, "Dealing with Interruptions," 9/14/2012
Philips Healthcare, Andover, MA, Lunchtime Seminar Series, 8/6/2012, "Alarm Safety for Healthcare."
ONR Netcentric Seminar Series, Washington, DC, The Suspicion Vessel Focuser, 7/27/2012
George Washington University, Washington, DC, CS Department Seminar Series, 1/25/2010, "Interactive Dirt: Increasing Mobile Work Performance with a Wearable Projector-Camera System."
Lehigh University, 4/15/2004, "Design for Human Interruption in Human-Computer Interaction."
Villanova University, 2/9/2004, "Design for Human Interruption in Human-Computer Interaction," Computer Science Department Colloquium Series.
DERA Portsmouth West (Defense Evaluation and Research Agency), Centre for Human Sciences, Fareham, UK, 8/27/1999, "Design for Human Interruption in Human-Computer Interaction."
Microsoft Research, Redmond, WA, 11/9/1998, "Design for Human Interruption in Human-Computer Interaction," MSR Colloquium Series.

Open-Source Software

McFarlane, Daniel C. (1998) Jumpers Game: A research platform for human interruption research with human subjects.
McFarlane, D. C. & Geigel, J. (1994) NervousSystem v.1.0.gwu: A Biologically-Based Simulator for Constructing and Simulating Networks of Neurons, Free Software Foundation's General Public License.

Invited Website Contributions

McFarlane, Daniel C., (April 4, 2005) Interruptions : Introduction to the theme, interruptions.net, About page, <https://interruptions.net/about.htm>

PATENTS AND PATENT PENDINGS

<Confidential> Provisional Patent Application, submitted, August 10, 2026.

METHODS AND SYSTEMS FOR PATIENT BASELINE ESTIMATION

Patent number: 11925474, Type: Grant

Filed: July 2, 2020, Date of Patent: March 12, 2024

Assignee: KONINKLIJKE PHILIPS N.V.

Inventors: Claire Yunzhu Zhao, Bryan Conroy, Mohammad Shahed Sorower, David Paul Noren, Kailash Swaminathan, Chaitanya Kulkarni, Ting Feng, Kristen Tgavalekos, Emma Holdrich Schwager, Erina Ghosh, Vinod Kumar, Vikram Shivanna, Srinivas Hariharan, Daniel Craig McFarlane

DISTRIBUTED EDGE-ENVIRONMENT COMPUTING PLATFORM FOR CONTEXT-ENABLED AMBIENT INTELLIGENCE, ENVIRONMENTAL MONITORING AND CONTROL, AND LARGE-SCALE NEAR REAL-TIME INFORMATICS

Patent number: 11601949, Type: Grant

Filed: August 20, 2019, Date of Patent: March 7, 2023

Assignee: Koninklijke Philips N.V.

Inventors: Daniel Craig McFarlane, Bryan Conroy

METHOD AND SYSTEM FOR IDENTIFYING INFECTION HOTSPOTS IN HOSPITALS

Publication number: 20220028533, Type: Application

Filed: April 10, 2020, Publication date: January 27, 2022

Inventors: Chaitanya KULKARNI, Mohammad Shahed SOROWER, Bryan CONROY, Claire Yunzhu ZHAO, David Paul NOREN, Kailash SWAMINATHAN, Ting FENG, Kristen TGAVALEKOS, Daniel Craig MCFARLANE, Erina GHOSH, Vinod KUMAR, Vikram SHIVANNA, Shraddha BARODIA, Emma Holdrich SCHWAGER, Prasad RAGHOTHAM VENKAT

SYSTEM FOR INFECTION DIAGNOSIS

Publication number: 20210134405, Type: Application

Filed: October 15, 2020, Publication date: May 6, 2021

Inventors: Ting Feng, Bryan Conroy, David Paul Noren, Daniel Craig McFarlane, Shreyas Ravindranath, Emma Holdrich Schwager

SYSTEM AND METHOD FOR ESTIMATING RESPIRATION RATE OF SUBJECT WEARING INSTANT HEART RATE MONITOR

Publication number: 2023P00493WO, Type: Application

Filed: November 30, 2023

Inventors: Luoluo Liu, Daniel Craig McFarlane

SURVEILLANCE SYSTEMS, PLATFORMS, AND METHODS FOR AUTONOMOUS MONITORING OF CLINICAL STUDIES

Publication number: US20250232851A1, Published Online (USPTO 20250232851)

Inventors: Liu, Luoluo (Cambridge, MA, US); Mariani, Sara (Cambridge, MA, US); McFarlane, David Craig (Cambridge, MA, US); Noren, David Paul (Cambridge, MA, US)

Filed: January 13, 2025

Current Assignee: Koninklijke Philips NV

IDENTIFICATION OF DISEASE ONSET BY MODELING SUBTLE PHYSIOLOGICAL CHANGES USING WEARABLE DEVICES

Publication number: WO2025176590A1, PCTEP2025054145

Filed: Feb. 17, 2025

Inventors: Liu, Luoluo, Salvati, Emmanuele, Conroy, Bryan, McFarlane, Daniel C.

SYSTEM FOR RESPIRATORY RATE DETERMINATION BASED ON MULTIPLE CONTACTLESS SENSING
MODALITIES AND RELATED METHODS

Publication number: WO2024121066A9, PCTEP2023084151

Filed: Dec. 04, 2023

Inventors: Mariani, Sara, Schulman, Daniel Jason, Haibo, Wang, McFarlane, Daniel C.

IDENTIFICATION OF PNEUMOCOCCAL, TYPHOID VACCINATION AND PLACEBO GROUPS BY MODELING
SUBTLE PHYSIOLOGICAL CHANGES FROM WEARABLE DEVICES

International Application No. PCT/EP2025/054145, 2025-Feb-17;

US application: 63/555,535, 2024-Feb-20;

European Union application: EP EP24174802, 2024-May-08;

Inventors: Luoluo Liu, Emmanuele Salvati, Bryan Conroy, Daniel Craig Mcfarlane.

HONORS & AWARDS

Philips Healthcare, HeathTech Innovation Drive 2015, Inspiration Award, 9/17/2015, Wearable Surveillance

Lockheed Martin Fellow, 1/1/2010 - 12/31/2012

Lockheed Martin Award of Distinction, 5/22/2004, HAIL-SS

Lockheed Martin Special Recognition Awards (17)

- 1/31/02, AugCog (Augmented Cognition)
- 1/31/02, HAIL-SS (Human Alerting and Interruption -- Surface Ship)
- 12/18/03, HAIL-SS
- 12/20/04, DD(X)
- 12/20/04, FastC2AP (Fast Connectivity for Coalitions of Agents Program)
- 3/10/05, HAIL-SS
- 6/23/05, FastC2AP
- 10/3/05, IBC (Integrated Battle Command)
- 10/3/05, STI [CASI, SEA] (Software Technology Initiative)
- 12/19/05, IBC
- 3/23/06, FastC2AP
- 7/20/06, IBC
- 9/21/06, FastC2AP
- 9/27/07, GILA (General Integrated Learning Architecture)
- 12/13/07, MSSOA TTP (Multi-Sensor Service Oriented Architecture)
- 11/24/09, <undisclosed>
- 11/24/09, SUMMIT (Supervision of UxV Mission Management by Interactive Teams)

Thomas Edison Memorial Fellowship (full funding), US Naval Research Laboratory, 1992-1995

US Naval Research Laboratory Special Acts Award, 1991, Novel Interaction Techniques Project

US Naval Research Laboratory Outstanding Performance Award, 1994

US Naval Research Laboratory Performance Awards (3)

- 5/31/1993, ISART (Interactive Situational Awareness and Roll-up Tool)
- 5/31/1994, ICID (Intelligent Control Interface Design)
- 5/31/1997, HAIL (Human Alerting and Interruption Logistics)

US Navy Unit Commendation Award, Secretary of the Navy, 1/1/1992 – 7/12/1996,

John A. Scribner Scholarship, 1985
Morton Adams Scholarship, 1984

PROFESSIONAL SERVICE

Reviewer, AAMI, BI&T journal, 2020 – present
Steering Committee Member, Association for the Advancement of Medical Instrumentation (AAMI), Alarm Safety Steering Committee, 2012 – 2016
Member, AAMI, Alarm Safety Standards Committee, 2012 – present
Lead, Lockheed Martin Fellows Action Team on Technology Transition (T2 FACT), 2011 – 2014
Moderator, IEEE Computer Society Webinars, 2011 – 2012
Reviewer, Human Factors Journal, 2020-present
Reviewer, IEEE Pervasive Computing, 2013 – present
Reviewer, Journal of Computer-Mediated Communication, 2013 – present
Reviewer, IEEE Journal of Selected Topics in Signal Processing, 2013 – present
Reviewer, Journal of Selected Topics in Signal Processing, IEEE Signal Processing Society, 2012
Moderator, IEEE Computer Society, Seminar, David Alan Grier (GWU), 2011;
Moderator, IEEE Computer Society, Seminar, Terry Bollinger (ONR/Mitre), 10/27/2011;
Social Sciences and Humanities Research Council of Canada (SSHRC), Reviewer, 2011;
Reviewer, ACM CHI Conference, 1991 – present
Reviewer, ACM UIST Conference, 1991 – present
Reviewer, ACM CSCW Conference, 2003 – present
Mentor, 10 Lockheed Martin ATL engineers and business development leaders, 2000 – present
Dissertation Committee Member, Protima Banerjee, Drexel University, advisor Dr. Hyoil Han
Seminar Series Chairman, NRL NCARAI, 1999 – 2000
Member, American Society of Naval Engineers, US Naval Institute
Member, National Defense Industrial Association
Member, ACM (Association for Computing Machinery)
Member, ACM SIGCHI (Special Interest Group on Computer-Human Interaction)
Member, IEEE (Institute of Electrical and Electronics Engineers)
Member, Sigma Xi
Member, Phi Kappa Phi
Chairman of the US NRL NCARAI 1999-2000 Seminar Series

COMMUNITY SERVICE

Co-director, Lynnfield Massachusetts FamilySearch Center, Lynnfield, MA, 2019-2013
Scout Master, Boy Scouts of America, Moorestown, NJ, 2003 – 2008
Assistant Scout Master, Boy Scouts of America, Moorestown, NJ, 2001 - 2003
Assistant Scout Master, Boy Scouts of America, Arlington, VA 1997 - 1998
Assistant Scout Master, Boy Scouts of America, Philomath, OR 1983 - 1984
"Science to School" Presenter, Roberts Elementary School, Moorestown, NJ, 2002 - 2007
LM ATL Robotics Workshop for Middle School, Counselor, LM ATL Cherry Hill, NJ, 2007
HAM radio operator, Technician License: KC2WDD
Eagle Scout, Boy Scouts of America, Las Vegas, NV, 1978

TEACHING EXPERIENCE

Conducted mentoring and on-the-job (OTJ) training for highly diverse groups of corporate and US Govt. R&D staff (most with graduate degrees) about multiple science and technical topics related to conduct valid and useful research, and about R&D financing, customer relations, and management (about 5-10 hours per week)

- Philips Healthcare, 2014-2023
- Lockheed Martin Advanced Technology Laboratories, 2000-2014
- US Naval Research Laboratory, 1990-2000
- Topics taught include: cognitive system architectures, ideation for innovation, alert & alarm generation/mediation/delivery, human-computer interaction, user-interface design, mobile user-interfaces, machine learning, system integration, task modeling, AI, end-user development, expert systems, knowledge representation, software engineering, systems architecture, evaluation, experimental methods, statistical analysis including nonparametrics, sociolinguistics, data visualization, research methods, human-subjects research methods, data privacy, social media data analytics, big data analysis, server hardware and networking to support AI/ML and big data analytics, grant/proposal writing, customer relations, technology transition, project management, financial tracking, contract negotiations, writing statement-of-works, technical writing, communications, public speaking, risk management, and others.

Conducted coaching and training for Boy Scouts of America troops, 1983 – 1984, 2001 – 2008

- Taught ~24 youth (11-18 years-old) to self-organize and run their own youth-led organization (about 7 hours per week).
- Topics taught include: hierarchical team organization, diversity, planning, leadership, authority, accountability, delegation, discipline, resource management, teamwork, collaboration, service, first aid, outdoor competencies, and other scouting skills.

INTERNATIONAL EXPERIENCE

Temporary work transfer (summer 2016) Philips Research, Patient Care and Measurements (PC&M), collaboration between business and research, High Tech Campus, Eindhoven, the Netherlands. CNE-C6F (US Navy 6th Fleet), DARPA, FastC2ap, Naples, Italy, three separate two-week assignments, 2005 – 2007, Evaluate NEPOCC TMFC & Intel ops. & identify potential tech. improvements
Missionary, Church of Jesus Christ of Latter-Day Saints, Catania Italy Mission, Sicily & Apulia, 1982-1983
Language: Italian and some Sicilian (not current).

PROFESSIONAL TRAINING

"Android Development for Java Programmers (CIT-243)," Bunker Hill Community College, Boston, MA, 12 May, 2016

"Good Clinical Practice (GCP) for Medical Devices: ICH GCP and ISO 14155," Barnett International, 17 December, 2015

"PIIC iX Basics," Philips Healthcare, 5/7/2017

"MX40 with PIIC iX ECG/SpO2/Resp," Philips Healthcare, 5/14/2014

"IntelliVue Information Center iX: Using Telemetry for ST/QT Monitoring," Philips Healthcare, 5/12/2014

"IntelliVue Information Center iX Fundamentals," Philips Healthcare, 5/07/2014

"Protecting Human Research Participants," National Institutes of Health (NIH) Office of Extramural Research, 9/02/2014

"Managing Proposals," Lockheed Martin ATL, 6/19/2012

"Entrepreneur Certification Series" (15 weeks), Burlington County College, Moorestown, NJ, 2010

"Lockheed Martin Customer Relations Institute (CRI)," Center for Leadership Excellence (CLE), July 27-29, 2009

"Lockheed Martin Management Fundamentals Program," Institute for Leadership Excellence, February 4-8, 2008

"Protecting Human Research Participants," National Institutes of Health, 2007, 2008, 2012

"Software Engineering Progress Group CMMI Level-3," Lockheed Martin ATL, 2007

"Proposal Writing," 12/12/2003, Lockheed Martin Advanced Technology Laboratories

"Project Leadership," 10/4/2001, PCI Global Inc. Bottom-Line Management

"Writing Winning Proposals," 6/7/2001, Shipley Associates

"Presenting Data and Information," 10/28/1998, Edward R. Tufte.

"Java Application Programming," 7/1997, Sun Educational Services.

"Introduction to Java Programming," 7/1997, Sun Educational Services.

"The Java Language," 3/1996, ACM Professional Development Seminar.

"GOMS Analysis for Parallel Activities," 5/1995, ACM CHI '95.

"Behavioral Evaluation of CSCW Technologies," 10/1994, ACM CSCW '94.

"Designing and Implementing Collaborative Applications," 10/1994, ACM CSCW '94.

"X-Window Systems Programming," 9/1994, Learning Tree International.

"Amplified Learning using Multi-Intelligence Engagement," 10/1993, ACM OOPSLA '93.

"How to Develop Frameworks," 10/1993, ACM OOPSLA '93.

"Metaobject Protocols and Open Implementations," 10/1993, ACM OOPSLA '93.

"Object-Oriented Concurrent Programming," 10/1993, ACM OOPSLA '93.

"Computer Supported Cooperative Work and Groupware," 5/1992, ACM CHI '92.

"Conversational Paradigms in User Interfaces," 5/1992, ACM CHI '92.

"An Introduction to Physically Based Modeling," 8/1991, ACM SIGGRAPH '91.

"Visualizing Multidimensional Data," 8/1991, ACM SIGGRAPH '91.