Automot 25th Ani	ive Research(nual Program Rev	Center view					
Ma	ay 15-16, 2019 Ann Arbor, MI	<u> </u>	ARC				
ARC Homepage	Program Review Homepage	Email for Event Inquiries	ARC Event Archives				
Registration Closed	The Automotive Research C modeling and simulation of g focus on basic scientific p	Center is a U.S. Army Cent ground vehicles, led by the U roblems associated with gr	er of Excellence for t Iniversity of Michigan. V round vehicles, includi	he We ing			
2019 Agenda	autonomy, management or power and energy within vehicles, mobility and survivability of the complete vehicle system.						
Biographies	Each year, we bring together members of the automotive research community from across academia, government and industry to share our latest research developments. It is an opportunity to discuss Army-relevant efforts, and to leverage and transfer our offorts to industry.						
Matrix	and transfer our efforts to industry.						
Technical Session	dedicated researchers at this event.						
Abstracts	For further inquires, please email: arc-event-inquiries@umich.edu						
Location & Lodging	Da Venue: Universit	ntes: May 15-16, 2019 ay of Michigan, Ann Arl	bor, MI 48109				
Event Parking	Registration is now closed.						
Around Town	Au	Organized by the tomotive Research Center					
2018 Event Photos	18 Event Photos In accordance with Cooperative Agreement W56HZV-19-2-0001 U.S. Army Combat Capabilities Development Command Ground Vehicle Systems Center Warren, MI						
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.S. Army CCDC Ground V	ehicle Systems Center	Visit Us	Contact Us	Copyri			

Automo 25 th Ai	otive F nnual F	Resear Program	ch Cente Review	er		
Ν	lay 15-	16, 201	9		ARC	
	Ann A	rbor, IVII				
ARC Homepage	Program R	eview Homepage	Email for Ever	nt Inquiries	ARC Event Archives	
Registration Closed		Day 1 Agenda Wednesday May 15				
Biographies	(click her	e or scroll down fo	or Day 2 program)	Francois Univer	s-Xavier Bagnoud Building (FXB) sity of Michigan (North Campus)	
Technical Session Matrix	0.20	Check in and I	in ht Duce life at	1320) Beal Ave, Ann Arbor, MI 48109	
	9.00	Welcome				
Technical Session Abstracts	2100	Prof. Bogdan Director Automotive Res	Epureanu search Center			
Location & Lodging		Dr. David Gorsich Chief Scientist U.S. Army Combat Capabilities Development Center (CCDC) Ground Vehicle Systems Center (GVSC)				
Event Parking	9.05	Opening Rema	rks			
Around Town	5105	Dr. Alec D. Ga Robert J. Vlasic	I limore Dean of Engineering a	at the University o	f Michigan	
2018 Event Photos	9:10	Keynote: Mr. Jeffrey La Director U.S. Army Com Systems Cente	<mark>nghout</mark> Ibat Capabilities Develo r (GVSC)	opment Command	(CCDC) Ground Vehicle	
	9:45	Keynote : COL Warren Sponsler Deputy Director Next Generation Combat Vehicle, Cross Functional Team (NGCV CFT) Army Futures Command				
	10:20	Break				
	10:35	Keynote: Mr. Craig Step Director Controls & Auto	ohens omated Systems, Ford	Motor Company		
	11:10	Spearheading	Solutions for the Wa	rfighter		
		Presenters fro	om U.S. Army CCDC Gr	ound Vehicle Syst	ems Center	
		Dr. Paramsot Mr. Victor Pa (GVSL)	hy Jayakumar, Seniol aul, Team Leader, Sy	r Technical Expert /stem Ground Ve	hicle Simulation Laboratory	
		Dr. Denise Riz	zzo , Senior Research N	lechanical Enginee	er	
		ARC research is the Warfighter. state of the ar military ground	s leading the way in d This presentation illus t to address key tech systems.	eveloping cutting strates how ARC p nical challenges in	edge attainable solutions for projects collectively push the n autonomy for high-priority	
	11:45	Group Photo &	Lunch			
	1:10 PM	Case Study 1 Learn Your Li Limits throug	mits: Protecting Aut h Learning	onomous Vehicle	es from Violating Safety	
		Faculty:	Ilya Kolmanovsky, And (University of Michigan	ouck Girard, Necm	iye Ozay	
		Student:	Kaiwen Liu, Nan Li, Zexiang Liu (Universit	Manuel Lanchare y of Michigan)	s Prieto, Liren Yang,	
		Government:	Denise Rizzo, Matt Ca	stanier (U.S. Army	(CCDC GVSC)	

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1:50 Case Study 2 Know Your Situation: Reconnaissance in Adversarial Environments with Manned and Unmanned Agents

 Faculty:
 Pratap Tokekar (Virginia Tech) Ed Durfee (University of Michigan)

 Student:
 Zhongshun Zhang (Virginia Tech)

Government: Jonathon Smereka, Joseph Lee (U.S. Army CCDC GVSC)

2:30 Break

- 2:45 Technical Session (matrix of parallel sessions) 1A: Human-Autonomy Teaming 1B: Electrification 1C: Terrain Modeling, Sensing for Autonomous Vehicles
- 4:05 **Poster Session** Researchers will give in-depth exposition of their research by their posters. We expect an exciting exchange of ideas.

5:30 - **Poster Session (cont.) & Networking - Strolling Dinner**

7:00

Day 2 Agenda Thursday May 16

- 8:30 Check-in and Light Breakfast
- 9:00

Sustained Superiority through Adaptability and Performance in Ground Vehicle Autonomy

Panelists

Panel:

Mr. Paul Decker

Deputy Chief Roboticist, U.S. Army CCDC Ground Vehicle Systems Center

Dr. David Gorsich

Chief Scientist, U.S. Army CCDC Ground Vehicle Systems Center

Dr. Rada Mihalcea

Professor of Electrical Engineering and Computer Science, Director, Artificial Intelligence Laboratory, University of Michigan

Dr. Carolyn Seepersad

Professor of Mechanical Engineering & General Dynamics Faculty Fellow, University of Texas at Austin

Moderator

Prof. Bogdan Epureanu Director, Automotive Research Center

Autonomous ground vehicles are becoming a reality at a fast pace due to extraordinary advances in sensors, controls, perception, and artificial intelligence. However, the uncertainty around these advances is still high, which makes it challenging to plan their deployment in new vehicles. Moreover, the activities of adversaries and the type of military operations/needs are evolving rapidly. Thus, autonomous ground vehicles must be highly adaptable. Technologies available now can be a near-term solution. However, sustained superiority requires both adaptability and sustained performance enhancements, which can be achieved only through a long-term strategy and an ecosystem of discovery. To address these needs, the ARC vision is to create highly adaptable systems and to seek performance breakthroughs by cutting-edge research and attainable technologies. The panel will discuss the challenges and opportunities in realizing this vision and in creating the future autonomous ground systems.

10:30 Break

- 10:45 Technical Session 2 (matrix of parallel sessions) 2A: Shared Control and Trust in Autonomy 2B:Powertrain and Fuels 2C: Structures and Reliability
- 12:15 PM Closing Remarks and Award Presentation Prof. Bogdan Epureanu Director Automotive Research Center

Dr. David Gorsich Chief Scientist U.S. Army Combat Capabilities Development Center (CCDC) Ground Vehicle Systems Center (GVSC)

12:45 - **Post Review Networking** 2:00

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2019 Agenda **Keynote Speakers and Panelists**

Biographies

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Technical Session Matrix

Technical Session Abstracts

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Around Town

2018 Event Photos



Mr. Jeffrey Langhout serves as the Director for the U.S. Army Combat Capabilities Development Command's (CCDC) Ground Vehicle Systems Center (GVSC). He leads a workforce of over 1,800 engineers, scientists, researches and support staff in delivering advanced technologies as required by the Army's strategic priorities and support to its Cross Functional Teams. Mr. Langhout also provides life cycle engineering solutions to the Army's Ground Combat Systems and Combat Support & Combat Service Support PEOs, the Tank Automotive Life Cycle Management Command, and the broader Department of Defense. In his capacity as the Director, Mr. Langhout ensures the GVSC is Forging the Future by developing world-class engineering talent in the areas of survivability and protection, autonomy and robotics, propulsion and mobility, electronics and power management, fuels and lubricants, and

ground system design and optimization. GVSC (formerly the Tank Automotive Research, Development and Engineering Center {TARDEC}) is the Army's primary organic engineering talent to develop the Next Generation Family of Combat Vehicles and thus deliver land dominance in the future fight.

> COL Warren Sponsler is a US Army Armor Officer currently serving as the Deputy Director for the Next Generation Combat Vehicle (NGCV) Cross Functional Team (CFT) at Detroit Arsenal, Michigan, as a part of Army Futures Command. COL Sponsler has served in a variety of command and staff positions around the operational Army including Company Command in the 3rd Infantry Division during Operation Iraqi Freedom in 2003 and multiple operational deployments around the world. COL Sponsler commanded the 1st Battalion, 66th Armor Regiment, 4th Infantry Division, at Fort Carson, Colorado, and in the Middle East supporting Operation Spartan Shield. Following command, COL Sponsler served as the Senior Brigade Combat Team (BCT) Observer/Control-Trainer at the National Training Center, Fort Irwin, California, and subsequently completed a US

Army War College Fellowship with the Massachusetts Institute of Technology (MIT) Security Studies Program (SSP) prior to assuming current duties.



Mr. Craig Stephens joined Ford Motor Company in 1987 working in Powertrain Calibration and Controls for Ford of Europe. In 1991 he moved to Dearborn, Michigan to lead a worldwide company effort to develop common Powertrain Control Algorithms and Software. A variety of other positions in P/T Controls and Software development followed. After a short spell in Visteon developing Electronic Throttle Controls he returned to Ford, first in Vehicle Program Controls integration and then leading an advanced project for a Mild Hybrid Powertrain. From 2001 to 2009 he was Manager of Powertrain Controls in Ford's Research and Advanced Engineering activity. He held the position of Assistant Chief Engineer for Global Powertrain Control Systems until 2012 when he moved back to Research to lead the newly formed Controls Engineering activity. In 2018 he was

appointed to the Position of Director: Controls and Automated Systems Research and Advanced Engineering with team members in Dearborn Michigan, Palo Alto California, Aachen Germany and Nanjing China. This activity has responsibility for every aspect of automotive controls from individual features through to complex vehicle level control systems required for electrified powertrains, automated driving and robotics. In addition to developing features for new products the team is also very active in developing the underlying engineering techniques in Systems, Software, Modeling & Simulation, Functional Safety, etc. necessary to delivery these complex systems to production.



Dr. Rada Mihalcea is a Professor in the Computer Science and Engineering department and Director of the Artificial Intelligence Laboratory at the University of Michigan. Her research interests are in computational linguistics, with a focus on lexical semantics, multilingual natural language processing, and computational social sciences. She serves or has served on the editorial boards of the Journals of Computational Linguistics, Language Resources and Evaluations, Natural Language Engineering, Research in Language in Computation, IEEE Transactions on Affective Computing, and Transactions of the Association

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for Computational Linguistics. Sne was a program co-chair for the

Conference of the Association for Computational Linguistics (2011) and the Conference on Empirical Methods in Natural Language Processing (2009), and a general chair for the Conference of the North American Chapter of the Association for Computational Linguistics (2015). She is the recipient of a National Science Foundation CAREER award (2008) and a Presidential Early Career Award for Scientists and Engineers (2009). In 2013, she was made an honorary citizen of her hometown of Cluj-Napoca, Romania.



Mr. Paul Decker assumed duties as the Deputy Chief Roboticist at the US Army Ground Vehicle Systems Center (nee TARDEC) in September 2018, located in Warren, MI. In this role he provides technical expertise and strategic support to Army Senior Leadership, and DoD Senior Leadership for Ground Vehicle System Autonomy and Robotics Technologies, and helps guide theoretical, experimental, and developmental programs for Autonomy and Robotics Technologies. Paul's prior assignments include: DARPA Deputy PM for the GXVT (Ground eXperimental Vehicle Technologies) & AVM (Adaptive Vehicle Make) programs, TARDEC Deputy Chief Scientist (helped direct TARDEC's Basic Research, Innovation Programs, and involvement in Army/Defense Science Board studies), TARDEC Associate Director for Analytical Simulation (Computer Aided Engineering), Director of the National Automotive Center (Army focal point

for the development of dual-use automotive technologies and their application to military ground vehicles), Group Lead for TARDEC Partnerships & Collaboration (responsible for identifying/pursuing external partnerships, collaborations, and opportunities for TARDEC with Industry, Other Government Agencies, and Academia).

Mr. Decker holds a M.S.E. in Electrical Engineering from the University of Michigan, and a B.S.E. in Materials Science & Engineering also from the University of Michigan. Mr. Decker is a member of the Army Acquisition Corps, and has Level III Army Acquisition Certification in Engineering.



Dr. Carolyn Seepersad is a Professor of Mechanical Engineering and General Dynamics Faculty Fellow at the University of Texas at Austin. She received a PhD in Mechanical Engineering from Georgia Tech in 2004, an MA/BA in Philosophy, Politics and Economics from Oxford University in 1998 (as a Rhodes Scholar), and a BS in Mechanical Engineering from West Virginia University in 1996. Dr. Seepersad's research involves the development of methods and computational tools for engineering design and additive manufacturing. Her research interests include simulation-based design of complex systems and materials, design for additive manufacturing, innovation, and environmentally conscious design of products and energy systems. Dr. Seepersad has earned many awards for her research and

teaching, including the 2009 inaugural International Outstanding Young Researcher Award in Freeform and Additive Manufacturing from the additive manufacturing community, the 2010 University of Texas Regents' Award for Outstanding Teaching by an Assistant Professor (the highest teaching award for faculty in The University of Texas System), the 2010 Outstanding Young Investigator award from the ASME Design Automation Committee, and the 2013 ASEE Outstanding New Mechanical Engineering Educator award. Dr. Seepersad is the recipient of a Best Paper Award for the 2009 ASME IDETC Design Theory and Methodology Conference, the 2015 ASME IDETC Design Education Conference, and two best paper awards for the 2010 ASEE Annual Conference and Exposition. She is also the author of more than 100 peer-reviewed conference and journal publications and one book. She co-organizes the annual Solid Freeform Fabrication Symposium, and she is a member of the executive committee for the ASME IDETC Design Automation Conference (2015 conference chair). She has also been a participant (2010) and session organizer (2011) for the annual NAE Frontiers of Engineering Symposium, a symposium organized by the NAE for a select group of emerging engineering leaders ages 30-45, an invited speaker for the 2013 German-American FOE, and a keynote speaker for the 2015 International Conference on Engineering Design (ICED). Her research has been featured by Popular Science, Science Daily, The Daily Dot, 3DPrint.com, and various additional media outlets. She teaches courses on product design, additive manufacturing, and design of complex engineered systems.



Dr. David Gorsich was selected for a Scientific and Professional (ST) position in January 2009 and serves as the Army's Chief Scientist for Ground Vehicle Systems. His current research interests are vehicle dynamics and structural analysis, reliability based design optimization, underbody blast modeling, terrain modeling and spatial statistics.

Prior to his current position, Gorsich served as the U.S. Army Tank Automotive Research, Development and Engineering Center's (TARDEC's) Associate Director, Modeling and Simulation (M&S), from July 2003 to December 2008. He has also served as the Acting Director, Strategic Plans and Programs, and the Team Leader for Robotics and Vehicle Intelligence. He served in various assignments at TARDEC, the Army Materiel Command, the Army Research Laboratory and for the Assistant Secretary of the Army (Acquisitions, Logistics and Technology). Gorsich previously

was an electrical engineer with McGraw Commercial Equipment Corporation in Novi, MI.

Gorsich was named a Society of Automotive Engineers (SAE) Fellow in 2008. He has served on the SAE Technical Standards Board for a 3-year term, been the chair for the SAE International Standards Committee for Ground Vehicle Reliability and also on the SAE Board of Directors. He has received several Commander's Coins, including: U.S. Army Central Command, GEN John Abizad, High Mobility Multipurpose Wheeled Vehicles Safety/Seat Experiments, 2005; Chief of Staff, GEN Peter Schoomaker, TARDEC M&S, 2005; West Virginia National Guard, 2004; U.S. Army TACOM, MG William M. Lenaers, Army-SAE Partnership, 2004; U.S. Army TACOM, MG N Ross Thompson Reliability 2003. Gorsich received the Detroit Federal Executive Board Award in 2001. Gorsich was recognized with the 1997 Army Research, Development and Acquisition Award, "Innovations in Ground Vehicle Signature Research."

Dr. Gorsich is recognized in many professional organizations for his research accomplishments. Gorsich serves as an Associate Editor for the International Journal of Terramechanics, and on the Editorial Board of the International Journal for Reliability and Safety, and as past Associate Editor for the Journal of Mechanical Design. He is a member of the Massachusetts Institute of Technology (MIT) Chapter of Sigma Xi, the Material Parts and Processes Council of SAE and the Senior Executives Association, ST Chapter.

Dr. Gorsich has published more than 150 conference and journal articles including more than 50 peer reviewed journal articles. He has published in the following peer reviewed journals: Transactions of SAE; International Journal of Vehicle Design; Journal of Mechanical Design; Journal of Commercial Vehicles; Contemporary Mathematics; Computational Statistics and Data Analysis; Physical Review D; Society of Automotive Engineers; Journal of Multivariate Analysis; Journal of Electronic Imaging; Optical Engineering; Pattern Recognition Letters; Statistics and Computing; Institute for Electrical and Electronics Engineers Transactions on Pattern Analysis and Machine Intelligence.

Gorsich holds a B.S. in electrical engineering from Lawrence Technological University. He holds an M.S. in applied mathematics from George Washington University and a Ph.D. in applied mathematics from MIT.

Presenters - Session One



Dr. Paramsothy Jayakumar is a Senior Technical Expert in Modeling and Simulation (M&S), SAE Fellow, and a member of the Analytics organization at the U.S. Army Ground Vehicle Systems Center (GVSC, formerly TARDEC) in Warren, Michigan. He received his M.S. and Ph.D. degrees in structural dynamics from the California Institute of Technology, and B.Sc. Eng. (Hons, First Class) from the University of Peradeniya, Sri Lanka. He began his career with the U.S. Army TARDEC in 2009 following employment with Ford Motor Company, BAE Systems, and Engineering Mechanics Research Corporation. He has worked in research, development, and engineering of ground vehicle mobility, on-road & offroad, and intelligent vehicles. Dr. Jayakumar is the recognized leader in the field of mobility and vehicle dynamics M&S in the DoD and automotive communities.

In addition to his personal accomplishments, Dr. Jayakumar is also an exemplary team builder, bringing together experts from the DoD, NATO, Academia, National Labs, and Industry to advance mobility research and development. He co-leads the Intelligent Vehicle Dynamics and Control thrust area for the Automotive Research Center, a U.S. Army Center of Excellence for Modeling and Simulation of Ground Vehicles. In that capacity, Dr. Jayakumar developed and successfully implemented a roadmap toward achieving the goal of autonomous mobility through M&S. He also led a NATO S&T Team that developed the Next-Generation NATO Reference Mobility Model (NG-NRMM) to replace the decades-old empirical model with a physics-based approach thus accommodating new vehicle designs, technologies, and M&S capabilities.

Dr. Jayakumar has written more than 200 technical publications including 2 book chapters, 50 journal articles and 100 conference papers, delivered 50 invited speeches, and holds two patents. He serves as an Associate Editor of the ASME Journal of Computational and Nonlinear Dynamics, and an Editorial Board Member for the International Journal of Vehicle Performance and the Journal of Terramechanics. His research in terramechanics, vehicle dynamics, and mobility won the best paper awards at the National Defense Industrial Association's Ground Vehicle Systems Engineering and Technology Symposium in 2011, 2012, and 2016. He was elected a Fellow of the Society of Automotive Engineers in 2013. He was also instrumental in developing seven SAE standards for tire testing for the purpose of tire modeling for which he received the SAE 2014 James M. Crawford Technical Standards Board Outstanding Achievement Award and Arch T. Colwell Cooperative Engineering Medal. His accomplishments at the U.S. Army TARDEC have been recognized with his competitive appointment in 2015 as the Senior Technical Expert for Analytics. In 2016, Dr. Jayakumar was awarded the Department of Defense Laboratory Scientist of the Quarter Award by Hon. Frank Kendall, Under Secretary of Defense for Acquisition, Technology and Logistics, for outstanding achievement in laboratory science and engineering.



Mr. Victor Paul serves as a Team Leader in the Ground Vehicle System Center's System Ground Vehicle Simulation Laboratory (GVSL) where he has worked for 28 years. He holds extensive knowledge in the area of motion base simulation and its application in both man and hardware in the loop experiments. He is currently a senior advisor for the Crew Optimization and Augmentation Technologies Science and Technology program and is supporting the development of Crew Station and Squad interfaces for the Next Generation Combat Vehicle – Mission Enabling Technology – Demonstrator.



Dr. Denise M. Rizzo is a Senior Research Mechanical Engineer for the Vehicle Performance Modeling & Team at US Army Ground Vehicle System Center (GVSC). She specializes in modeling, simulation and control of propulsion systems of ground vehicles. Dr. Rizzo received her Ph.D. from Michigan Technological University in 2014. From 2000 through 2008 she was a controls research and development engineer in the Powertrain Group at Chrysler LLC. She joined GVSC in November of 2008 and was promoted to her current position in 2017. Dr. Rizzo has received 8 awards for



outstanding contributions during her time at GVSC, which include J. Cordell

Breed Award for Women Leaders awarded by the Society of Automotive Engineers in 2017, a Horizon Award for product development awarded by the Women in Defense in 2016 and a best paper award for an article in the Journal of Systems and Control awarded by the Institution of Mechanical Engineers in 2010. She is an active member of Society of Automotive Engineers (SAE), Society of Women Engineers (SWE), National Defense Industrial Association (NDIA) and Women in Defense (WID). Dr. Rizzo has published 17 articles in archival journals, 30 papers in refereed conference proceedings, 4 technical government reports, and holds 2 patents.

Poster Award Committee



Dr. André Boehman is a Professor of Mechanical Engineering, University of Michigan, Associate Director of the Automotive Research Center, and Director of the Walter E. Lay Automotive Laboratory. He joined U-M in 2012 after serving for 18 years at Pennsylvania State University, where he held a position as a Professor of Fuel Science, Materials Science and Engineering, and Mechanical Engineering in the Department of Energy & Mineral Engineering, and taught courses on Energy, Fuels, Combustion and the Environment. Prof. Boehman's research interests are in alternative and reformulated fuels, combustion and pollution control. Now at the Auto Lab at U-M, Prof. Boehman is developing laboratory facilities to continue his research in advanced fuels and combustion. His present research activities are focused on

alternative diesel fuels, diesel combustion and diesel exhaust aftertreatment. He is a recipient of the 2009 John Johnson Award for Outstanding Diesel Engine Research and the 2009 Arch Colwell Award from the Society of Automotive Engineers. He serves as an Associate Editor for Energy & Fuels. Fellow of the Society of Automotive Engineers.



Dr. Richard Gerth is the Deputy Chief Scientist for the US Army CCDC's Ground Vehicle System Center (GVSC). The Chief Scientist's Office is responsible for managing GVSC's basic research portfolio as well as promoting the growth and development of its research workforce.

Prior to his current position, Dr. Gerth was a Senior Research Engineer on the Materials Application and Integration team responsible for conducting research in vehicle lightweighting technologies. His primary research interests are in high Manganese steels, operational metrics for weight reduction in military vehicles, and open innovation processes.

Dr. Gerth has over 60 publications and presented at numerous national and international conferences. He earned his B.S. from the University of Wisconsin - Madison and his Ph.D. from the University of

Michigan - Ann Arbor.



Dr. Robert W. Sadowski is a member of the Scientific and Professional (ST) cadre of the Senior Executive Service and serves as the Robotics Senior Research Scientist within the Research, Technology and Integration Directorate at the US Army CCDC Ground Vehicle System Center in Warren, MI. Selected to this position after a long career within the Army culminating as an Academy Professor and Electrical Engineering Program Director in the Department of Electrical Engineering and Computer Science at the United States Military Academy where he was instrumental in developing the Academy's robotics education program, research facilities, and outreach. He remains an Adjunct Professor on the faculty there. He also has over forty months of operational experience in Southwest Asia in a variety of leadership, staff, and engineering positions including Iraq and recently Afghanistan.

Dr. Sadowski leads the Army Robotics Community of Practice whose purpose is to ensure the community is progressing towards the unified vision of delivering unparalleled autonomyenabled capabilities from across the S&T enterprise.

Bob is a graduate of US Military Academy with a BSEE and received his M.S. and Ph.D. in electrical engineering from Stanford University as a Fannie and John Hertz Fellow. He also holds a Masters in Strategic Studies from the US Army War College. He is a Senior IEEE member and member of the Eta Kappa Nu, Tau Beta Pi, Phi Kappa Phi and Sigma Xi national honor societies.



Dr. Talia Marie Sebastian earned her Doctorate in Biomedical Sciences: Health and Environmental Chemistry from Oakland University in 2016 through the US Army SMART Scholarship Program, with a specialization in Analytical and Geological Chemistry. Dr. Sebastian currently serves CCDC-GVSC Ground System Performance Fluids Team as a Research Chemist with a specialization in Computational Tribochemistry and Subject Matter Expert for solid film lubricant coatings. Currently, her research efforts are aimed at furthering the fundamental understanding of tribochemical reaction phenomena occurring in boundary lubrication conditions and the continued development of computational tribology models. She is also a member of both the American Chemical Society and the Society of Tribologists and Lubrication Engineers.



Dr. Michael Tess is a research mechanical engineer assigned to the Powertrain team at the U.S. Army Combat Capabilities Development Center (CCDC) Ground Vehicle Systems Center (GVSC) in Warren, Michigan. He graduated from the U.S. Military Academy at West Point, New York, in 1999 with a B.S. in chemistry, and served over 9 years on active duty in the U.S. Army as a multifunctional logistics officer. He received his M.S. (2010) and



Ph.D. (2014) degrees in mechanical engineering from the University of

Wisconsin-Madison, followed by a postdoctoral research fellowship at the U.S. Army Research Laboratory's Vehicle Technology Directorate, Aberdeen Proving Ground, Maryland, prior to joining GVSC in 2015. His research interests include turbulent flows, heat transfer, alternative fuels, and premixed and nonpremixed flames. Dr. Tess has published 15 conference and

journal articles related to combustion in IC engines.

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Registration Closed	Technical Session Matrix							
2019 Agenda	Click here for instructions for session leads and presenters							
Biographies	Talks listed by projects. Final version will have full talk titles. Rooms to be confirmed.							
Technical Session Matrix	May 15	1A: Human-Autonomy Teaming	1B: Electrification	1C: Terrain Modeling, Sensing for Autonomous Vehicles				
Technical Session		Session Lead: Victor Paul	Session Lead: Denise Rizzo	Session Lead: Paramsothy Jayakumar				
Abstracts	2:45 pm	PI: Vijitashwa Pandey A Decision-Based Mobility Model for Semi and Fully Autonomous Vehicles	PIs: Heath Hofmann, Bogdan Epureanu Computationally Efficient Models for Electro-Magnetic- Structural Dynamics, Heat Convection, and AC Resistance for Electric Machines within Electrified	PI: Hiroyuki Sugiyama Physics-Based Multiscale Continuum-Discrete Deformable Terrain Model for Off-Road Mobility Simulation				
Around Town	3:05	PI: Dimitra Panagou	Powertrains PI: Anna Stefanopoulou	PI: Shravan Veerapaneni				
2018 Event Photos		Adversarially Robust Coordination for Autonomous Multi-Vehicle Systems	Advanced Battery Diagnostics: Decode the information in Electrode Swelling	Massively Parallel Solvers for Complementarity Problems				
	3:25	PI: Bogdan Epureanu AI-Based Attacker-Defender Dynamics of Adaptable Fleets of Autonomous Vehicles	PI: Jason Siegel AVPTA Optimization of Scalable Military Fuel Cell Hybrid Vehicles	PI: Jeremy Bos Localization, mapping, and path planning performance from LIDAR point-clouds				
	3:45 - 4:05	PI: Yue Wang Trust-based Control and Scheduling for UGV Platoon under Cyber Attacks	PI: Don Siegel Computational Discovery of Hydration Reactions for Thermal Energy Storage	PI: Thomas Oommen Terrain Strength Characterization Using Remote Sensing				
	May 16	2A: Shared Control and Trust in Autonomy	2B: Powertrain and Fuels	2C: Structures and Reliability				
		Session Lead: Victor Paul, Paramsothy Jayakumar	Session Lead: Pete Schihl, Denise Rizzo	Session Lead: David Lamb				
	10:45 am	PI: Brent Gillespie The Role of Roles: Adaptive Haptic Shared Control for Remote Steering of an Unmanned Ground Vehicle	PI: John Wagner A Hybrid Thermal Bus Cooling System for Military Ground Vehicle and Electric Motors	PI: Georges Fadel Investigation and Optimization a Structure to Provide Energy Loss built from an Elastic Material				
	11:05	PI: Tulga Ersal Mutually-Adaptive Shared Control between Human Operators and Autonomy in Ground Vehicles	PI: Marcis Jansons Boundary Conditions for Predictive Combustion Simulation	PI: Nick Vlahopoulos Fatigue Resistance Optimization of Armored Vehicle Structures				
	11:25	PI: Dawn Tilbury Modeling Bi-directional Trust in Semi-autonomy for Improved System	PI: Andre Boehman Ignition Studies for Kinetic Mechanism Development and Validation	PI: Zissimos Mourelatos, Vijitashwa Pandey Data-Driven Reliability of Repairable Systems using and Effective Age Approach with a Limited Failure Population				
	11:45 - 12:05	PI: Huei Peng Physics Enhanced AI: A Novel Hierarchical Lane Detection						

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