

JOHN SHULL

Chesapeake, VA 23323 | (757) 375-8227
JShull@odu.edu

EDUCATION

PHD STUDENT ENGINEERING, MODELING & SIMULATION, September 2014 - Current

Old Dominion University, Norfolk, VA

Augmented/Mixed/Virtual Reality, User Design Theory in AR, Serious Games, & Data Visualization.

MASTERS OF ENGINEERING, MODELING & SIMULATION, Completed August 2014

Old Dominion University, Norfolk, VA

Emphasis in Visualization and Agent Based Modeling

BACHELORS OF SCIENCE IN BUSINESS ADMINISTRATION, Completed December 2011

Old Dominion University, Norfolk, VA

Dual Major: Marketing and Decision Sciences

PROFESSIONAL EXPERIENCE

SENIOR PROJECT SCIENTIST

Virginia Modeling Analysis Simulation Center (VMASC), Old Dominion University, Suffolk, VA

**OCT 2017-
CURRENT**

RESPONSIBILITIES

- Provide technical solutions to research faculty at VMASC
- Facilitate extended reality (XR) development within the paradigms of modeling and simulation
- Lead technical teams to develop research-to-enterprise solutions dealing with interactive comprehensive visualization systems, physical to digital efforts, user design theory in and around spatial systems, and leading efforts in immediate turn-key use cases within the XR environment
- Contribute to open source policies (when applicable), help facilitate an agile framework for better project management and workflow efficiencies - this includes the adoption of inclusive design protocols - as well as utilizing software technologies to help ensure research project success
- Help develop project protocols that abide by University practices, new security requirements, updates to internal project methodology
- Migrating older research projects to cloud enabled capable solutions
- Assist in any/all VMASC activities, projects, and personnel that involve XR capabilities.
- Help facilitate VMASC STEAM outreach events
- Help assist the SEA Lab manager in the development of proof of concept applications for use to demonstrate core VMASC strengths

PROJECTS

- **Narrative Modeling: Situational Influence Spatial Modeling Tool**
 - The primary investigator is Dr. Beth Cardier & Dr. Saikou Diallo
 - VMASC Internally funded project
 - The primary developer and intellectual property partner for a new extended reality (XR) narrative conceptual modeling software.
 - Working directly with PI's to build user design into new XR software that will function across devices, spatial location, and the cloud
- **Digital Shipbuilding: Grant 51011152017130742 funded by the Go-Virginia Foundation.**
 - The primary investigator for the project is Dr. Jennifer Michaeli
 - Part of a team responsible for overseeing the setup and equipment purchases for an extended reality (XR) IoT lab at VMASC
 - Part of a team responsible for maintaining and running of the VMASC

**DEC 2018-
CURRENT**

**SEP 2018-
CURRENT**

DigitalShipbuilding Lab

- Lead Developer for various applications and proof of concept work for numerous community outreach and education events
 - Helped establish a XR lab at the William & Mary Applied Research Center
 - Part of a team responsible for the initial setup of a community outreach center, makerspace, and workforce development hub for the city of Newport News - the Brooks Crossing Center - opening in August 2019
- STEAM on Spectrum: a biannual community outreach event for families with Autism. **OCT 2018-CURRENT**
 - Lead developer on various interactive experiences for a wide range of children.
 - Responsible for helping coordinate the events as well as overseeing the events themselves
 - Will the Internet of Things Be Inclusive? IRBNet ID: 1189999-11 **JUN 2018-AUG 2019**
 - The primary investigator for the project is Dr. Krzysztof Rechowicz
 - Lead developer on an Amazon Web Services Alexa Skill that was designed to collect data to serve two main goals.
 - Adapt an IoT device to help children with Autism Spectrum Disorder (ASD) that are between the ages of 2-14 improve their verbal and echoic communication skills.
 - Evaluate whether such tools can significantly improve their verbal echoic communication skills
 - Responsible for curating, analyzing, and processing the research results.
 - Managed the relationship with the partner organization in which the study was performed at - the Mea'Alofa Autism Support Center located in Suffolk Virginia
 - VR Artist Study: IRBNet ID: **NOV 2017-MAY 2018**
 - The primary investigator for the project is Dr. Krzysztof Rechowicz
 - Helped in facilitating an IRB study involving 15 artists and using virtual reality software
 - Supervised 15 artists through a controlled VR software portion of the live study
 - Developed custom visualization solutions of the motion data captured through the study and then provided that solution as a VR visual analysis solution to the researchers
 - Catalhoyuk Digital Senses VR Experience **DEC 2017-FEB 2018**
 - Developer on upgrading an existing experience to include tetherless VR.
 - Full sensory experience - using custom olfactory emitters, infrared head, custom props, and motion data to provide an interactive engaging VR experience.
 - Users were transported back in time 6000 years to Catalhoyuk - a Western Turkey city - in which users are able to explore a recreation of a standard living quarters

GRADUATE RESEARCH ASSISTANT*MSVE Department, Old Dominion University, Norfolk, VA*SEP 2014–
SEP 2017

RESPONSIBILITIES

- Taught ENG 110 courses every Fall Session
- Department tutor
- Facilitated the development and running of ODU College of Engineering Booths at select local and international conferences
- Responsible for maintaining and developing in-lab demonstrations for interactive augmented/virtual reality applications
- Help create and maintain department social media accounts
- Collaborated with English Language Center for on-campus enrichment activities and help establish a cross-departmental relationship

PROJECTS

- **Stern2STEM:** Grant 11899718 funded by the Office of Naval Research (ONR) AUG 2015-
SEP 2017
 - A pilot program conducted by ODU in the College of Engineering.
 - Project is designed around students who have served in the military and providing them successful support through their degree program completion
 - Lead Unity developer for serious game applications
 - Lead content and artist developer
 - MAVEN: a Windows serious game application focused on pre-calculus concepts
 - CAPTIVATE: an Android and iOS mobile application focused on calculus, physics, and chemistry concepts.
- **Augmented Reality Research:** Grant # ODU-04-01 Sub Award # 2A92-OD SEP 2015-
JAN 2016
 - A feasibility project in developing protocols for initial work in developing an augmented reality application for use in an industrial complex
 - Project was co-sponsored with NASA Langley's Compressor Station
 - Graduate student responsible for all major development work
 - Reverse engineering external mesh from lidar point cloud data for a 1960's compressor
 - Identifying current market software for automatic mesh generation
- **Augmented Reality Research:** Contract # NNL 13AA08B Subcontract # T13-6500-ODU Task Order # 6587-OD MAY 2017 -
AUG 2017
 - A continuation of research with NASA Langley and the Compressor Station to build and develop a near-real time augmented reality data visualization of sensor data for mission critical equipment
 - The main developer of an augmented reality application for distribution on the Microsoft HoloLens
 - Development of a WCF application for local data distribution and communication over a personal area bluetooth network
 - All UX and UI content development for application.

STUDENT CHAIR- STUDENT CAPSTONE CONFERENCE*MSVE Department, Old Dominion University, Norfolk, VA*APR 2012–
APR 2017

RESPONSIBILITIES

- Student chair appointed in the coordination and development of the Student Capstone Conference
- Directly assist the MSVE graduate program director
- In charge of all digital media, marketing, website development, student coordination, conference handbook publication, and track chair coordination.
- Responsible for creating the yearly proceedings as well as curating the previous proceedings

AWARDS

- Recognized for excellent service at the 2017 Student Capstone Conference

GRADUATE RESEARCH ASSISTANT*MSVE Department, & Old Dominion Research Foundation, Norfolk, VA***FEB 2013–
AUG 2013**

RESPONSIBILITIES

- Worked on the development of a field study involving transportation departments of the City of Virginia Beach and City of Suffolk
- Project focused on research associated with Dr. ManWo Ng
- Funded project through the Virginia Innovation Partnership associated with the U.S. Department of Commerce i6 Challenge

PRIVATE
EXPERIENCE**CONSULTANT***Rockwell Restaurant LLC, Norfolk, VA***MAR 2011–
AUG 2014**

RESPONSIBILITIES

- Assisted business owner in all aspects of small business development
- Explored various projects related to decision factors for target customers
- Designed and implemented a back office system for maintaining daily financial records with inventory management systems.
- Development of forecasting systems for seasonal inventory ordering and procurement Taught ESL courses in all skill areas and levels in an IEP

SELECTED ACCOMPLISHMENTS

- Within the first year an immediate reduction in general costs of goods from an average of 45% to 32% with a direct increase to take home profits

AWARDS

GENE NEWMAN AWARD

Best overall paper for the 2016 Student Capstone Conference

*An annual student award established by Mike McGinnis in 2007 for outstanding overall best presentation, best paper, and research contribution***OLD DOMINION UNIVERSITY INFOGRAPHICS COMPETITION**

Runner-up for the 2013 ODU Infographics Competition

*Recognized for outstanding data mining and data management techniques**A competition held by Dr. Michele Weigle of the Computer Science Department***ODU ENGINEERING EXCELLENCE AWARD**

Recognized graduate student of the year for 2016 for the MSVE department

*An annual awards banquet for the Batton College of Engineering where they celebrate and recognize faculty, staff and students for the previous year*VOLUNTEER
EXPERIENCE**VIDEO GAME DESIGN AND DEVELOPMENT CLUB***Leadership & Student Involvement, Old Dominion University, Norfolk, VA***SEP 2016–
MAY 2017**

Help assist and mentorship of a student organization. Assisted in hosting virtual reality tutorials and guided workshops for student officers.

PUBLICATIONS

Cardier, B., **Shull, J.**, Nielsen, A., Diallo, S., Casa, N., Lundberg, P., Sanford, L. D., Ciavarrá, R., Goranson, T. "A Narrative Modeling Platform: Representing the Comprehension of Novelty in Open World Systems" a book chapter in *Human-Machine Shared Contexts*. Lawless, W., Mittu, & R., Sofge, D. (Eds.) Elsevier (Expected 2020)

Collins, A., **Shull, J.**, & Thaviphoke, Y. "The need for simple educational case-studies to show the benefit of soft operations research to real-world problems." *International Journal of System of Systems Engineering* 9, Vol. 9, no. 1 (2019): 75-97.

	<p>Rechowicz, K. J., Diallo, S. Y., Garcia, H. M., Shull, J., B., & Cvijetic, B. "Making digital sense [s]: fundamentals." In Proceedings of the Annual Simulation Symposium (Article No. 13). Society for Computer Simulation International (2018). ISBN: 978-1-5108-6014-8</p> <p>Smith, K., Shull, J., Shen, Y., Dean, A., & Heaney, P. "A framework for designing smarter serious games." A book chapter in <i>Smart Universities</i>. Uskov, V., Bakken, J., Howlett, R., Jain, L. (Eds.) Springer International Publishing (2018): 263-294. Doi: 10.1007/978-3-319-59454-5_9</p> <p>Smith, K., Shull, J., Dean, A., Shen, Y., & Michaeli, J. (2016) "SIGMA: A software framework for integrating advanced mathematical capabilities in serious game development." <i>Advances in Engineering Software</i> 100 (2016): 319-325</p>
CONFERENCE PRESENTATIONS	<p>Smith, K., Shull, J., Shen, Y., Dean, A., & Michaeli, J. (2017) Overcoming challenges in educational STEM game design and development. Winter Simulation Conference Las Vegas, NV (accepted)</p> <p>Smith, K., Shull, J., Shen, Y., Dean, A., Heaney, P., & Michaeli, J. (2017) Overview of game and content design for a mobile game that will prepare students in calculus and physics prerequisites to the engineering curriculum. ASEE Annual Conference & Exposition, Columbus OH</p> <p>Smith, K., Shen, Y., Shull, J., Dean, A., & Michaeli, J. (2016) A toolkit for presenting advanced mathematics in serious games. Presented at IEEE SouthEastCon, Norfolk VA</p> <p>Obeid, M., & Shull, J., (2013). West Nile Virus a Systems Dynamics Investigation in Dallas County, TX. Winter Simulation Conference, Washington, DC.</p>
INVITED PRESENTATIONS	<p>The Idea Fest Hosted by Booz Allen Hamilton (2016) Invited presenter at the for the Ignite sessions. Presentation title: 'Sensing technologies and how they are changing everything we do.' Presented March 5, 2016 at Town Point Club Norfolk, VA</p>
PUBLISHED PROCEEDINGS	<p>Smith, K., Shull, J., Shen, Y., Dean, A., & Michaeli, J. (2017) Overcoming challenges in educational STEM game design and development. Winter Simulation Conference Proceedings WSC 2017 (accepted)</p> <p>Heaney, P., Smith, K., Shull, J., Eller, B., Dean, A., Shen, Y., & Michaeli, J. (2017) Stern2STEM: Implementation of a feed forward model for educational game development. Proceedings of ASNE Day 2017 Technology, Systems, & Ships.</p> <p>Obeid, M., & Shull, J. (2013). West Nile Virus a Systems Dynamics Investigation in Dallas County, TX. Winter Simulation Conference Proceedings WSC 2013 (F.182)</p>
POSTERS	<p>Shull, J., & Smith, K. (2016). A Toolkit for presenting advanced mathematics in serious gaming. Presented at the American Society of Naval Engineers (ASNE) annual conference 2016</p>
LOCAL CONFERENCES	<p>Smith, K., Shull, J., Shen, Y., Dean, A., & Michaeli, J. CAPTIVATE: Employing classic game mechanics in a serious STEM game. Presented in the gaming and visualization track at the 2017 Student Capstone Conference Norfolk, VA (<i>Best Presentation</i>)</p> <p>Shull, J. (2016). An agent_zero approach for Chicago police complaints. Presented in the Agent Based Modeling Track at the 2016 Student Capstone Conference Norfolk, VA (<i>Best Paper / Best Presentation</i>)</p> <p>Shull, J., & Shen, Y. (2016). Visualizing and reverse engineering large industrial equipment using lidar point clouds. Presented in the gaming and visualization track at the 2016 Student Capstone Conference Norfolk, VA</p>

Smith, K., Shull, J., Dean, A., Shen, Y., & Michaeli, J. (2016) MAVEN: A serious mathematics game for veteran education. Presented in the Visualization and Gaming track at the 2016 Student Capstone Conference Norfolk, VA

TECHNOLOGY / SOFTWARE

Amazon Web Services | IAM, Cognito, S3, DynamoDB
Game Engines | Unity3D
Simulation Software | Arena, Anylogic, NetLogo 5
3D Modeling | Sketchup, GeoMagic Design X, & Solidworks
Web & Multimedia | Adobe Creative Cloud - Illustrator, Photoshop, Premiere- Google Analytics, Google Maps API, Survey Monkey, GoDaddy hosting services, AWS cloud support, Wacom devices, and Wordpress blog studios.
Microsoft Office | Word, PowerPoint, Excel, Office, Publisher, Outlook
Course Management Systems | Blackboard, CourseSites, Google Classroom
Google Applications | Docs, Sheets, Slides, Forms, Classroom
Audio Software | Audacity & Praat
Screencasting | Camtasia
Social Media | Facebook, Twitter, Instagram, Pinterest, Reddit, SnapChat, LinkedIn, Slack
Virtual Communication | Skype, Google Hangouts, Windows Live, Lync
Extended Reality | MRTK, ARKit, ARCore, HoloLens, all Windows based HMD's

DEVELOPMENT LANGUAGE

Primary developer language is C# and the .NET framework also familiar with C++, CSS, Cg, Grbl, HTML-5, Java, Javascript, OpenGL, Python, SQL, and various API's associated with AR/VR development work: Vuforia, OpenVR, MRTK, ARKit, ARCore, Microsoft HoloLens, SteamVR, VRTK, Unity 3D

PROFESSIONAL MEMBERSHIPS & CERTIFICATIONS

International Game Developer Association, Society for Modeling & Simulation Student Member, American Society of Naval Engineers Student Member, Member of the Norfolk PixelFest Developer Group & FAA Small UAS Certificate of Registration# FA3HHL9APE

RESEARCH INTERESTS

Research of M&S application in areas of visualization, augmented/mixed/virtual reality, user design theory in augmented reality, game design in educational environments, big data representation in mixed reality, and agent based modeling of complex adaptive systems.

CONTINUING EDUCATION

UDACITY SELF DRIVING CAR PROGRAM, August 2017 - December 2017
Online Degree Program(s)

- Computer Vision and Deep Learning - *currently enrolled in this section*
- Sensor Fusion, Localization, and Control
- Path Planning, Concentrations, and Systems

UDACITY DEEP REINFORCEMENT LEARNING PROGRAM, April 2019- August 2019
Online Degree Program(s)

- Introduction to Deep Reinforcement Learning
- Value-Based & Policy Based Methods, Multi-Agent Reinforcement Learning

REFERENCES

Dr. Yuzhong Shen
Graduate Program Director and Associate Professor
MSVE Department
Old Dominion University
(757) 683-6366
yshen@odu.edu

Dr. Saikou Diallo
Chief Scientist
Virginia Modeling Analysis Simulation Center
Old Dominion University
(757) 638-6320
sdiallo@odu.edu

Dr. Stuart Kirkham Cole
Research Directorate (D327)
NASA Langley Research Center
(757) 864-5450
stuart.cole@nasa.gov