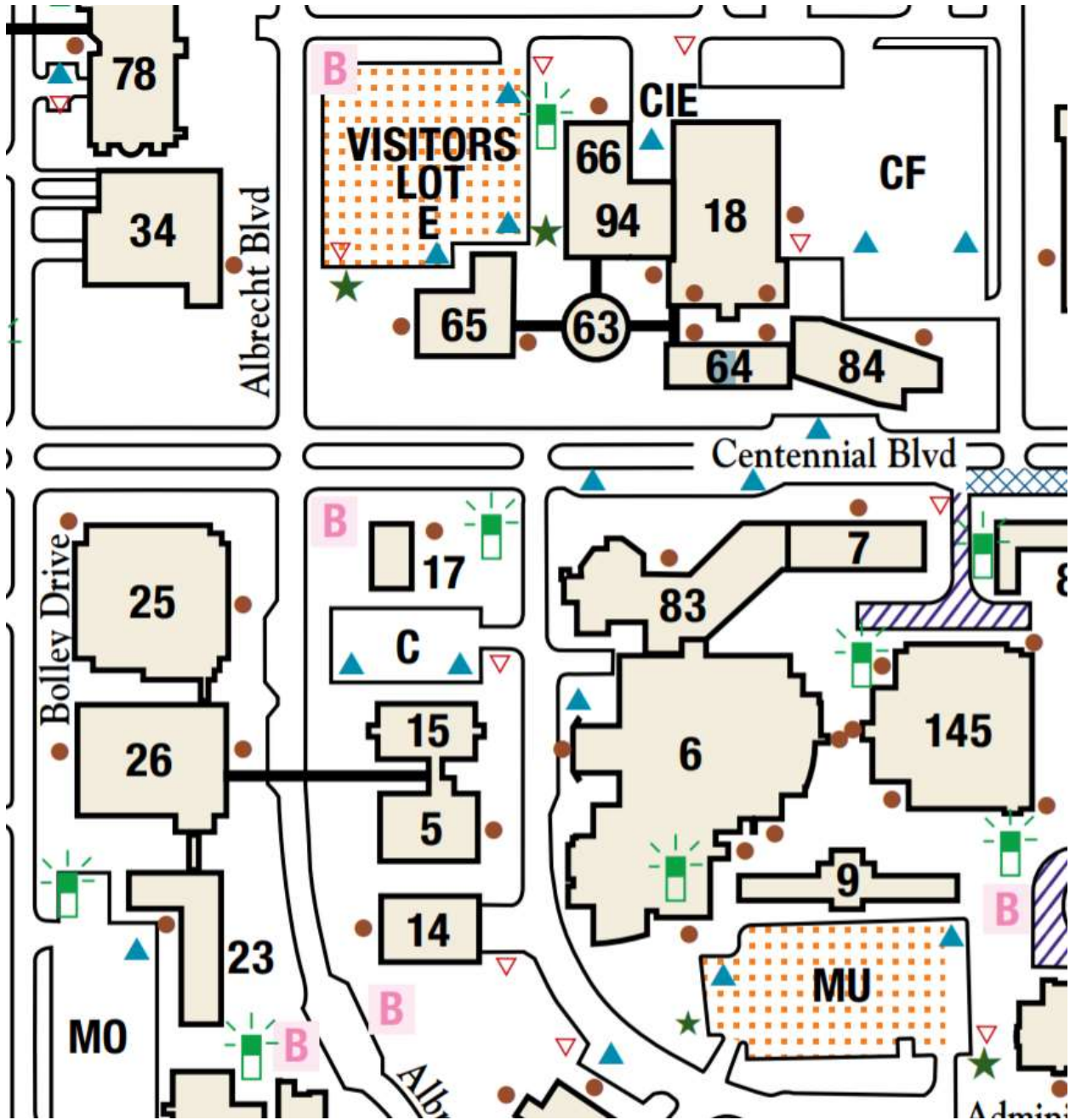# Midwest Instruction and Computing Symposium

2019

Schedule & Program

Parking:

Lot 'C' – North Dakota State Fleet Vehicles ONLY (no permit needed)

Lot 'MU' & Visitors Lot 'E' – Collect permit at west door to Memorial Union (building 6)

Events:

Quentin Burdick Building – 25

Memorial Union - 6

Schedule

Friday, April 5th

10:00 AM – 3:00 PM – Registration   (Memorial Union 2nd floor lobby)

Noon – 4:00 PM – Hacking Village   (Quentin Burdick Building Lobby)

1:00 PM – 3:00 PM – Parallel Sessions I   (Memorial Union 2nd floor rooms, as indicated)

1:00 PM – Late – Cybersecurity Competition   (Quentin Burdick Building 422/424)

2:30 PM – 4:00 PM – Robot Competition Practice   (Quentin Burdick Building 104)

3:00 PM – 4:00 PM – Refreshments & Posters   (Quentin Burdick Building Lobby)

4:00 PM – 6:00 PM – Parallel Sessions II   (Memorial Union 2nd floor rooms, as indicated)

4:00 PM – 6:00 PM – Robot Competition   (Quentin Burdick Building 104)

6:00 PM – 7:00 PM – Dinner   (Quentin Burdick Building Lobby & 102, 104, 106)

7:00 PM – 11:00 PM – Programming Competition   (Meet in QBB 104)

Saturday, April 6th

7:30 AM – 8:30 AM – Steering Committee Meeting

8:00 AM – 8:30 AM – Light Breakfast   (Quentin Burdick Building Lobby)

8:30 AM – 10:00 AM – Parallel Sessions III   (Memorial Union 2nd floor rooms, as indicated)

8:30 AM – Noon – Cybersecurity Competition   (Quentin Burdick Building 422/424)

10:00 AM – 10:30 AM – Refreshments   (Quentin Burdick Building Lobby)

10:30 AM – Noon – Parallel Sessions IV   (Memorial Union 2nd floor rooms, as indicated)

Noon – 1:00 PM – Lunch, Keynote Panel & Awards   (Quentin Burdick Building Lobby & 102, 104, 106)

Meals & Snack Menu

Friday, April 5th – Dinner

Meat & Cheese with Crackers
Fresh Fruit
Vegetables with Crackers

Lemonade
Ice Water

Friday, April 5th – Dinner

Main Courses
Meat Lasagna
Vegetarian Lasagna
Chicken Bacon Macaroni
Tuscan Chicken Bacon Macaroni

Salad
House Salad with Homemade Dill Ranch

Sides
BLT Dip with Baguettes
Taco Dip with Tortilla Chips
Layered Pizza Dip with Baguettes
Queso Dip with Tortilla Chips
Popcorn Chicken with Cajun Ranch
Chicken Strips with BBQ Sauce
Cocktail Meatballs – Sweet Chili

Beverage
Lemonade
Ice Water

Dessert
Traditional Lemon Sheet Cake

Saturday, April 6th – Breakfast

Egg Bake – Ham and Cheese
Egg Bake – 3 Meat
Egg Bake - Denver
Egg Bake - Veggie
Croissant Bake - Blueberry
Croissant Bake - Caramel

Orange Juice
Ice Water

Saturday, April 6th – Lunch

Hamburgers – Grilled Live!
Kettle Chips

Lemonade
Ice Water

FRIDAY

Session 1

Cybersecurity I - Kendall E. Nygard, Chair
Room: Hidatsa

1:00 PM	Md. Minhaz Chowdhury	Cloud Security: Challenges, Attacks, and Techniques
1:30 PM	Sayeed Sajal	Cyber-Physical System Security Treats: Challenges and Solutions
2:00 PM	Md. Minhaz Chowdhury	Honeypots: Security by Deceiving Threats
2:30 PM	Kendall Nygard	Trust and its influence on Technology

Computing Education - Karen Arlien, Chair
Room: Arikara

Nancy Mahlen	Promulgating Computer Science in High School Education
Muhammad Abusaqer	Teaching Computer Packages to Students Different in Everything
Andrew Jones	Analysis of Autonomous Robotic Competitions for Problem-Based Learning
Warren S. Vaz	Promoting Undergraduate Computing and Engineering Research via Educational and Scientific Drones Case Study: Hexacopter Drone with Raspberry Pi Module

Session 2

Cybersecurity II - Kendall E. Nygard, Chair
Room: Hidatsa

4:00 PM	Md. Minhaz Chowdhury	Security Issues of SCADA Systems
4:30 PM	Kendall E. Nygard	Identifying Malicious Users Through Behavior
5:00 PM	Emerald Simkhada	Security Threats/Attacks via Botnets and Botnet Detection & Prevention techniques in Computer Networks: A Review
5:30 PM	Teddy Pare	Darknet and Black Market Activities against the Cybersecurity: A Survey

Visualizations I - Ben Bernard
Room: Arikara

Riley Conlin	Deep Network Ice Crystal Classification using Spatial Pyramid Pooling for Inconsistent Image Dimensions
David Doll	Visualizing Real-time Feedback of a Rehabilitation Trainer
Ronald Marsh	Visual Means for 3D Printer Quality Assessment
Ben Bernard	Designing and Implementing a low cost 3D printer farm

FRIDAY

Session 1

Mobile
Room: Badlands

Web & Cloud
Room: Mandan

Time	Presenter	Title	Presenter	Title
1:00 PM	Israt Jahan	Mobile Applications Online Review and Rating Research: A Systematic Analysis and Heuristic-Systematic Model	Tamaike Brown	Cloud Security Model CSM 2.0: An Autonomic Cloud Security Gateway
1:30 PM	Wen-Chen Hu	Robust Privacy Preservation of Location-Based Services Using Dummy Locations or Routes	Erich Rice	Evaluation of the Performance of Two Public Cloud Computing Platforms Through the Use of a Distributed Encryption System
2:00 PM	Sayeed Sajal	Need and Challenges of Edge Computing in Software Engineering for Internet of Things (IoT)	Ashley Creps	Web Accessibility: an Introduction
2:30 PM	Matthew Wright	Finding Minimal Spanning Forests in a Graph	Trevor Tracy & Thomas Marrinan	Web Browser Rendering and Interaction in Custom OpenGL Applications

Session 2

Artificial Intelligence I - Andrew Jones, Chair
Room: Badlands

Software Engineering - Sayeed Sajal, Chair
Room: Mandan

Time	Presenter	Title	Presenter	Title
4:00 PM	Mohamed Omar	Interpolating Historical Photos Using Neural Networks	Sayeed Sajal	System Issues in Software Development-Problems, Effects and Solutions
4:30 PM	Cohl Dorsey	Artificial Civ: Deep Learning Strategies for Multiplayer Turn-Based Video Games	Saleh Alnaeli	How to Empirically Assess the Quality of Software Source Code in The Era of Multicore Architecture and Multithreaded Programming
5:00 PM	Naomi Green	Neural Networks in Robotics	Sayeed Sajal	Impact of Software Tools and Environment to the Development Process
5:30 PM	Tribikram Adhikari	Comparing the Viability of Different Machine Learning Models to Predict Student Retention	Tamaike Brown	Machine Learning (ML) Framework for Identifying Inconsistencies in Software Requirement Document (SRD)

FRIDAY

Session 2
Nifty Assignments
Room: Meadow Lark

Time	Presenter	Title
1:00 PM	Thomas E. Gibbons	Nifty Assignment: Jupyter Notebooks in the Cloud with Google's Colab
1:30 PM	Darren Seifert	Nifty Assignment: Incorporating Game Design in an Introductory Computer Science Classroom
2:00 PM – 2:30 PM	Panel	Faculty Birds-of-a-Feather

SATURDAY

<u>Session 3</u>

Cybersecurity III - Kendall E. Nygard, Chair
Room: Hidatsa

Visualizations II - Ben Bernard, Chair
Room: Arikara

8:30 AM	Mohammad Barrawi	Safe Functions Algorithm	Ben Bernard	Virtual Reality Labs and Curriculum Integration
9:00 AM	Dennis Guster	Protection Effectiveness and Vulnerabilities of the Heap With in Docker Container Systems	Adam Poland	Haptic Interface for the Visually Impaired
9:30 AM	Divyaa Kamalanathan	Comparing NoSQL and SQL database systems based on vulnerability to injections and adequacy of countermeasures	Ben Bernard	Augmented Reality Sand Table for Teaching and Research

<u>Session 4</u>

Cybersecurity IV - Kendall E. Nygard, Chair
Room: Hidatsa

Data Communications - Joe Latimer, Chair
Room: Arikara

10:30 AM	Jeremy Straub	No Courses, No Budget, No Hardware … No Problem: Development of an Agile Cybersecurity Program	Sumin Yi	Evaluating the impact of time delays and start sequence for effective congestion control using TCP Reno, Westwood and Vegas
11:00 AM	Demitrius Fenton	Overview of NDSU Computer Science Cyber Range Development	Brandon Mord	Method for Decoupled and Cohesive Data Communication in Avionics with Non-Terminating Threads
Noon	Donald Heier	Developing Cybersecurity Degree Programs to Meet Workforce Needs	Gary Griswold	Quantitative Analysis to Verify Fairness of TCP CUBIC in NS-2

SATURDAY

Session 3

	Artificial Intelligence II - Simone Ludwig, Chair **Room: Badlands**		**Infrastructure & Testing - Joe Latimer, Chair** **Room: Mandan**	
8:30 AM	Amrita Chatterjee	Solving Travelling Salesman Problem with Probabilistic Elitist Ant Colony Optimization	Sayeed Sajal	Test-driven development(TDD) - Challenges and Potential Pitfalls
9:00 AM	Shawn Saliyev, Nicholas M. Plucker, Nicholas Freitag McPhee	Rerunning the Course of Evolutionary Computation	Erik Steinmetz	Building a Computer Cluster Using Recently Retired Server-Grade Computers
9:30 AM	Salvatore Skare	Using a Recurrent Neural Network and Articulatory Synthesis to Accurately Model Speech Output	Shaun Lynch	Reviewing an Academic Computing Infrastructure: Reflecting on the Past to Forge a Path into the Future

Session 4

	Artificial Intelligence III - Simone Ludwig, Chair **Room: Badlands**		**Applications - Andrew Jones, Chair** **Room: Mandan**	
10:30 AM	Scott Kerlin	Creating a Machine Learning Algorithm to Play a Collection Mini-Game	Mao Zheng	Exploring Restaurants' Text Reviews vs. Rating using Yelp Dataset
11:00 AM	David Mathias	A Co-evolutionary Genetic Algorithm to Avoid Airline Passenger Denied Boarding	Scott Kerlin	Using Parallelization and SIMD to Compute Graph Colorings
Noon	Lakshmi Priya Girish Kumar	Text mining on business and computer science undergraduate internship job postings		

SATURDAY

<u>**Session 3**</u>
Innovations - Andrew Jones, Chair
Room: Room of Nations   **Room: Prairie Rose**

8:30 AM	Michael Witham	Comparative analysis of MariaDB's performance efficiency as a suitable replacement for MySQL	Panel — A BOF Discussing Professional Development in CS for K12 Teachers
9:00 AM	Ian Gilbert	Git Repositories	
9:30 AM	John Repko	Jump-starting The "Computer Revolution" That Hasn't Begun Yet	

<u>**Session 4**</u>
SW Project Management - Sayeed Sajal, Chair
Room: Room of Nations   **Room: Prairie Rose**

10:30 AM	Sayeed Sajal	Software Project Management and its Related Factors	Panel — Additive Manufacturing & Its Applications
11:00 AM	Sayeed Sajal	Software Project Management and Underlying Development Factors	

Noon

Posters

Baozhong Tian	Hue-assisted Convolutional Neural Network for plant stem segmentation
Chanaka Bulathsinghalage	Identifying Frequent Single-cell Inter-chromatin Interaction Regions with Networks
Malvern Madondo	Judging a whale by its tail: A Kaggle Humpback Whale Identification Challenge
Nathan Beneke	An Automated Proof-Checking System In ClojureScript
Bricyn Jameson	Data Storage Architectures
Ethan Uphoff	A system for improving beginner-level error messages in Clojure
Donald Heier	Pi Based Scoreboard Featuring Individually Addressable LED's
Rachael Platt	Polylactic Acid Durability in Relation to 3-Dimensional Printing

Underwater Robot Testing

Research Experience for Undergraduates

On Cyber-Physical System Cybersecurity

10 Week Program

Program Runs: June - August, 2019 & 2020
Application review: Underway for 2019

Gain hands on experience writing software for robots and with cybersecurity tools

Student participants will work on real research projects, guided by experienced mentors. You will get the opportunity to work with cutting edge robots and other cyber-physical systems (such as SCADA systems, building automation and sensor networks). You will also get to use real-world cybersecurity tools and solve real cybersecurity problems!

Get paid and gain a great item for your resume ...

Participants will receive a stipend of up to $5,000, room and board, up to $750 for travel reimbursement to/from Fargo and use of athletic facilities.

Learn how to develop software that has to work securely ... where it matters ...

Software for robots and other cyber-physical systems has to work — and it has to be secure. If it doesn't work or malfunctions, people could be injured or property could be destroyed. Learn best practices that apply to any software development environment.

Visit a Missile Silo and a Cybersecurity Event

As part of the REU, students will get to visit a decommissioned missile silo and learn how nuclear missiles were secured. The group will also attend a national cybersecurity event, featuring hacking competitions, scholarly presentations and more.

Be a part of a National Science Foundation-funded Research Experience for Undergraduates focused on cyber-physical system cybersecurity.

Learn more and apply at:

https://www.ndsu.edu/cybersecurity/reu/

NSF

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