3-Minute Thesis Challenge

October 28, 2020
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October 28, 2020

6:00 PM Mountain Time (US & Canada)

Join Zoom Meeting:
https://zoom.us/j/7995989114
Phone in: 1-346-248-7799

Graduate students will be competing for cash prizes and entry into the regional 3-Minute Thesis Challenge competition to be held in March 2021.

First Place - $500
Second place - $300
Third place - $100
Honorable Mention - $50
Event Schedule

- Opening Remarks
- Rules and Regulations
- Introduction of Judges
  - Dr. Les Cook, Chancellor, Montana Technological University
  - Dr. John Garic, Professor, Business & Information Technology, Montana Technological University
  - Dr. Jennifer Keane Dawes, Former Dean, Graduate School, University of Maryland Eastern Shore
  - Dr. K. Jodi Gear, Equine Veterinarian, Medical Illustrator (retired)
- Competitors
  - Carson Bechtel
  - Prakash Gautam
  - Paul Helfrich
  - Sydney Jennings
  - Amanda Marinovich
  - Marshall Metcalf
  - David Rathgeber
  - MD Salah Uddin
- Closing Remarks from the Judges
- Announcement of Prizes
- Closing Statements
Carson Bechtel

Degree: MS—Environmental Engineering
Advisor: Dr. Katherine R. Zodrow
Title: Living Filtration Membranes Demonstrate Antifouling Properties
Abstract: The fouling performance of Living Filtration Membranes was compared to commercial polymer membranes with natural waters. Physical properties of membranes were characterized, and membrane fouling layers quantified with epifluorescent confocal microscopy.

Prakash Gautam

Degree: MS—General Engineering
Advisor: Dr. Peter Lucon
Title: Particle Tracking of a Simulated Melt Pool of Selective Laser Melting (SLM)
Abstract: The surface flow of a melt pool of Selective Laser Melting (SLM) was simulated as binary images by using a MATLAB script. A particle tracking algorithm was developed using various functions from the MATLAB Image Processing Toolbox to track the surface oxide particles in the simulated binary images.
Paul Helfrich

Degree: MS—Ecological Restoration
Advisor: Dr. Amy Kuenzi
Title: T. bryosalmonae: The PKD Organism
Abstract: Proliferative kidney disease (PKD) is an acute inflammatory response to the replication of the myxozoan parasite Tetracapsuloides bryosalmonae within the kidney tissues of salmonid fish. The prevalence of fish kills by PKD is unknown, but changes in water temperature related to climate change may lead to more frequent mortality events.

Sydney Jennings

Degree: MS—Geochemistry, Industrial Hygiene, Biochemistry
Advisor: Dr. Katie Hailer
Title: Protein Expression in Mammalian Cell Lines After Low-Level Metal Exposure
Abstract: Mining in Butte, Montana has been ongoing since the 1900’s. Very limited human biomonitoring has been conducted to determine the health effects of the metal-mixture exposures in Butte. This study aims to investigate metal distributions, determine metal bioavailability, quantify protein expressions, and investigate metal mixture interactions in mammalian cell lines.
Amanda Marinovich

Degree: MS—Industrial Hygiene, Data Science
Advisor: Dr. Dave Gilkey
Title: ATV/UTV Injuries in MT Workers' Comp Claims
Abstract: This is a descriptive analysis of a dataset of workers' compensation claims involving off-road vehicles. The aim is to compare injury trends between vehicle types, and to provide insight into the safety of ATV/UTV use in the Montana workplace.

Marshall Metcalf

Degree: MS—General Engineering
Advisor: Dr. Peter Lucon
Title: Development of Laser-Assisted Fused Deposition Modeling Process Using ABS
Abstract: 3D-Printed thermoplastic parts exhibit reduced mechanical properties compared to injection molded parts of the same material, limiting the use of 3D-Printed parts in functional applications. A laser-assisted fused deposition modeling method was developed to increase the mechanical strength of 3D-Printed thermoplastics by promoting molecular formation, growth, and entanglement.
David Rathgeber  
**Degree:** PhD—Materials Science  
**Advisor:** Dr. Lee Richards  
**Title:** CFD Modeling of Large Diameter Horizontal Wellbores to Study the Effects of Drill Pipe Rotation on Cuttings Transport Efficiency  
**Abstract:** In a world where climate change concerns are steadily increasing, Exploration companies are searching for ways to drill longer wells to reduce footprint. Understanding drill pipe rotation effects on cuttings transport efficiency through Computational Fluid Dynamics modeling could be a key to drilling more efficient and longer laterals.

Md Salah Uddin  
**Degree:** PhD—Materials Science  
**Advisor:** Dr. Brahmananda Pramanik  
**Title:** A Non-Destructive Method for Strength Evaluation of Metal  
**Abstract:** Charpy impact testing is a standard laboratory testing method (ASTM E23) to measure the toughness of the materials. In this method, a pendulum-hammer strikes the specimen to break. A digital microscope was applied to measure the fractured surface roughness that correlates with the strength of the materials.