



CENTER FOR INNOVATION THROUGH  
VISUALIZATION & SIMULATION

**PURDUE**  
UNIVERSITY  
NORTHWEST



2200 169<sup>th</sup> Street  
Hammond, IN 46323

219.989.2765  
civs@pnw.edu  
www.pnw.edu/civs



## CIVS Shines at AISTech 2021 Conference in Nashville

CIVS had a record number of presentations and awards at the annual AISTech - The Iron & Steel Technology Conference and Exposition from June 29 to July 1 2021 in Nashville, TN. CIVS researchers and their industry collaborators had 11 technical presentations, 3 Best Paper awards, and 3 out of 6 student contest awards (1<sup>st</sup> & 2<sup>nd</sup> place in the Graduate Student Poster Contest and 2<sup>nd</sup> place in the Undergraduate Student Project Presentation Contest), as well as an AIME Honorary Membership for the CIVS Director.

AISTech 2021 is Steel's Premier Technology Event. Despite the pandemic, over 4,000 professionals attended to learn about the latest products, processes, research, technology advancements and digitalization transformation. [More...](#)



## NSF Research Experience for Teachers (RET) Welcomed for Six Week Summer Program at CIVS

Welcome NSF RET teachers! The opening ceremony for the RET summer program was held at the CIVS Immersive Theater on June 14th. The program is sponsored by the National Science Foundation (NSF). The RET selected twelve high school and community college teachers to conduct research by using simulation and visualization technologies to solve real-world problems in the steel industry. The RET teachers will transfer their summer experience to interactive teaching simulators to be used in their classrooms to inspire their students to pursue STEM education and careers.

The RET teachers were warmly welcomed by PNW Provost, Dr. Kenneth (Chris) Holford; Interim Dean of the College of Engineering and Science (CES), Dr. Dietmar Rempfer; and department chairs of CES. [More...](#)



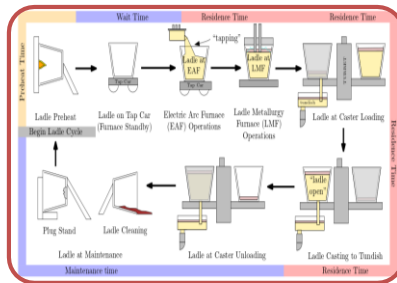
## CVIS Director Presents on the AIST Foundation Grant Webinar

CVIS Director, Professor Chenn Zhou was invited to talk at the Association of Iron and Steel Technology (AIST) Foundation Grant Webinar on May 4<sup>th</sup>. As the first recipient of the AIST Digital Transformation for Steel Manufacturing Grant in 2019, Prof. Zhou shared her experience in proposal writing and project outcomes. She also talked about how AIST grants provide professors and students good opportunities in the steel industry. [More...](#)



## CVIS Presents Smart Ladle at 2021 AIST Digital Transformation Forum

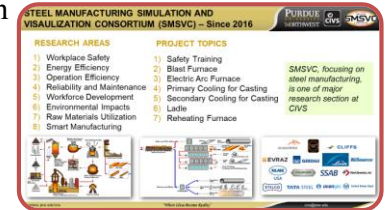
Nicholas Walla (Research Engineer) presented “Smart Ladle: An AI-based Tool for Optimizing Casting Temperature” at the virtual 2021 AIST Digital Transformation Forum on May 18<sup>th</sup>. [More...](#)



## Invited Talk: SSAB R&D Monthly Seminar Series

Dr. Chenn Zhou gave a virtual invited talk at SSAB R&D Monthly Seminar Series on June 23<sup>rd</sup>. Her talk was on “Application of Simulation and Visualization in the Steel Industry”.

[More...](#)

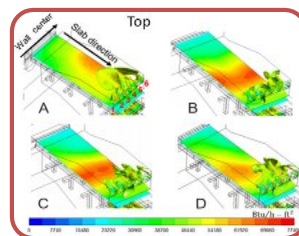


## Presentation: Virtual Reality Die Casting at NADCA Meeting

Senior Research Scientist John “Jack” Moreland presented at the North American Die Casting Association’s (NADCA) R&D meeting on June 10<sup>th</sup> in Arlington Heights, IL. The presentation included the latest progress of the ongoing virtual reality die casting simulator for workforce development. [More...](#)

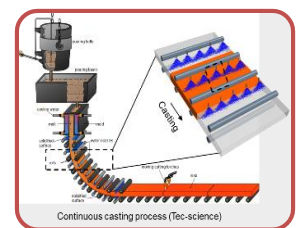
## Presentation: Oxygen-Enrichment in a Reheat Furnace at ASME SHTC 2021

Dr. Armin Silaen presented the “Reduction of Fuel Utilization through Oxygen - Enriched Combustion in a Pusher - Type Reheat Furnace” at the ASME SHTC 2021. [More...](#)

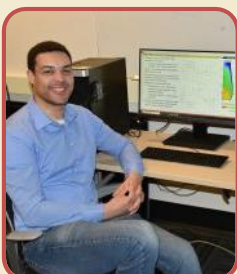


## Presentation: Spray Cooling at the Thermal and Fluids Engineering Conference

Haibo Ma (Ph.D. student), presented “Investigation of Spray Cooling Uniformity and Intensity during Continuous Casting of Steel” on May 28<sup>th</sup>. [More...](#)



## Promotion of Dr. Tyamo Okosun & Dr. Armin Silaen



Congratulations to Dr. Tyamo Okosun and Dr. Armin Silaen for being promoted from Senior Research Engineer to Research Associate Professors at Purdue Northwest. Dr. Armin K. Silaen joined CVIS at PNW in 2011. He has led industrial research projects involving multiphase reacting flow in CVIS. Dr. Tyamo Okosun has also worked at CVIS since 2011. He has been the team leader for various steel industry projects to improve energy efficiency and carbon foot-print in areas such as the blast furnace. [More...](#)





## CIVS Student Honored with the Chancellor's Medallion



Congratulations to Emily Higley, CIVS undergraduate research student majoring in Mechanical Engineering. She received the Chancellor's Medallion and is the graduating senior with the highest GPA in the College of Engineering and Sciences. Furthermore, she is admitted to 4+1 combined BS/MS program and will continue her research on reheating furnace simulations to investigate hydrogen combustion for her Master's Thesis at CIVS. [More...](#)

## Munster High School Students Collaborated with CIVS

Two Munster High School students, James Krieg and Daniel Cornejo, completed their "High School Internship" program organized by MCE dept. In collaboration with CIVS. Their final presentation showed the results of a 3D - printed prototype of their



iris mechanisms for a solar reactor developed in animated 3D visualizations of the mechanisms with simulated lighting using Unity 3D at CIVS. [More...](#)

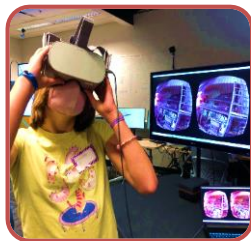
## NSF RET Teachers Visit Cleveland-Cliffs Steelmaking Plant

On June 16<sup>th</sup> & June 23<sup>rd</sup>, the NSF RET teachers and their mentors visited Burns Harbor, a fully integrated steelmaking plant of Cleveland-Cliffs Inc. Larry Fabina, Manager of Continuous Improvement, warmly welcomed all the teachers. The teachers have gained more experience of steel manufacturing processes, which helps them have a deeper understanding of their research projects. [More...](#)



## Local Teens Learn VR and Simulation at Engineering Camp

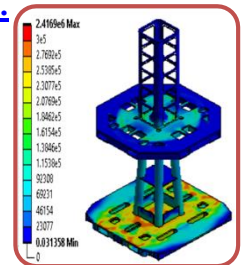
Over 40 teens from around Northwest Indiana visited CIVS in June as part of PNW's MCE 2021 Summer Camp to learn Computer Simulation, 3D Visualization, and Virtual Reality by experiencing a variety of immersive and interactive activities. [More...](#)



## CIVS Students Receive PNW Awards

Congratulations to the following students:

- Saswot Thapa (2<sup>nd</sup> place in graduate competition) and John Rosser, Nathaniel Doan & Emily Higley (2<sup>nd</sup> place in undergraduate competition) won the awards at Purdue Northwest 2021 Days of Discovery. [More...](#)
- Jose Martinez & Joseph Madrigal and Emily Higley, Nathaniel Doan, & John Rosser won the 1<sup>st</sup> and 2<sup>nd</sup> place respectively in the Engineering Senior Design competition in May 2021. [More...](#)

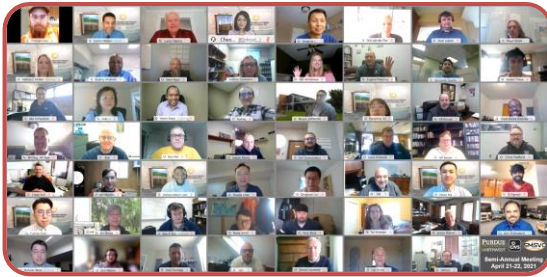


## Student Success Story: Haibo Ma



CIVS Graduate Research Assistant Haibo Ma received a Doctoral Degree in Mechanical Engineering from Purdue University West Lafayette. Haibo has conducted various research projects at CIVS since 2015 for his MS and Ph.D. degrees. Through his Ph.D. thesis research "On Heat Transfer Mechanisms in Secondary Cooling of Continuous Casting of Steel Slab", Haibo has developed several spray and solidification models as well as a Heat Transfer Coefficient Simulator. Haibo said, "CIVS and SMSVC provided an extraordinary range of opportunities for experiential learning. It is a tremendous advantage to my future career." [More...](#)

## SMSVC Hosts Successful Virtual Semi-Annual Meeting



The SMSVC held its 3rd virtual semi-annual meeting on April 21<sup>st</sup> & 22<sup>nd</sup>. There were 109 attendees from the 15 member companies and CIVS. The attendees indicated that they were again very impressed and satisfied with the quality of work and the depth of technical presentations. [More...](#)



### SMSVC NOTES

**2021 Annual Meeting:**  
**Nov. 10 – 12, 2021**

#### SMSVC Accepting New Members

SMSVC is accepting new members. If interested in becoming a member, please contact Melissa Mollett at [mmollett@pnw.edu](mailto:mmollett@pnw.edu).

For more information on the Consortium, visit [steelconsortium.org](http://steelconsortium.org).

## CIVS Kicks off Three New Research Projects

Three new CIVS projects recently kicked off with SMSVC members. These include 1) Simulation and optimization of a blast furnace in collaboration with long-time CIVS partner and SMSVC member company Stelco; 2) Development of a new safety training simulator with Steel Dynamics using



Interactive 360-degree videos for hazard recognition; and 3) Simulation and evaluation of a flue gas duct system at Nucor’s steel plant in Crawfordsville, IN. [More...](#)

## Cleveland Cliffs Gift Enables Cutting Edge Student Research



The Cleveland Cliffs Campus Partnership Program gifted CIVS with funds to purchase cutting-edge simulation and visualization hardware for student researchers to develop projects related to

the steel industry. An AR headset used for developing lockout-tagout procedures, and VR headsets for developing virtual training and safety scenarios are some of the research projects being enabled by the gift. [More...](#)

## AIME Honorary Membership Award



Dr. Chenn Zhou, was selected as an Honorary Member of AIME, which is one of the highest honors the Institute can bestow on an individual in

appreciation of outstanding service to the Institute and for recognition of distinguished scientific achievement. She was recognized “for her innovative work in the field of advanced visualization technology, her passion for applied digital technologies, the promotion of industry-academia collaboration, and ongoing support for workforce development...” [More...](#)

### Facts and Impact [Since 2009]

- \$40+ million savings for companies
- \$29,100,000+ in external grants and contracts
- 160+ external organizations collaborated with CIVS
- 410+ projects
- 600+ national and local news
- 1,720+ students employed and mentored
- 11,370+ students used CIVS for virtual labs
- 150+ Purdue Northwest faculty and staff collaborators
- 282 student awards and grants (globally, since 2011)
- 35,600+ local and global visitors