



CENTER FOR INNOVATION THROUGH
VISUALIZATION & SIMULATION

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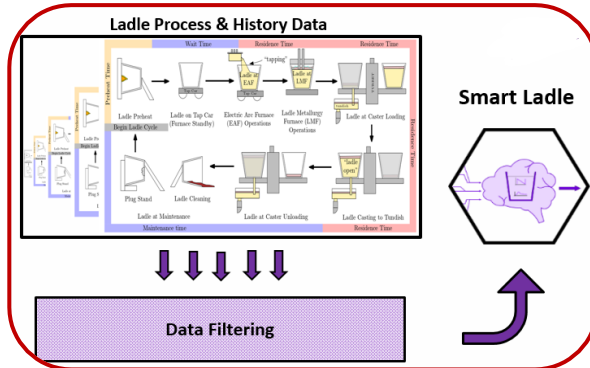


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“Smart Ladle” A Hunt-Kelly Outstanding Paper at AIST



CIVS researchers received the 2022 Hunt-Kelly Outstanding Paper Award – third place for “Smart Ladle: AI-Based Tool for Optimizing Casting Temperature”. The authors include CIVS staff, students, and a collaborator in Steel Dynamics. AIST selects three technical papers from the best published papers of the previous year’s conference. The papers are judged

for excellence, originality, relevance to the technology of the iron and steel industry.

[More...](#)

Chenn Zhou Recognized as an AIST Distinguished Member and Fellow

Dr. Chenn Zhou was selected as an AIST Distinguished Member and Fellow in March 2022. She was honored for “her extraordinary passion and commitment for the Association’s mission of service to the steel industry. A prolific researcher, author, and educator of computer-aided modeling, simulation, and visualization technologies, Dr. Zhou has given her energy and expertise to program AIST symposia to facilitate the early adoption of digitalization technologies to promote industry leadership in smart manufacturing applications...” There have



been 119 Distinguished Member and Fellows of over 15,500 members. [More...](#)

CIVS Highlighted at the 7th ArcelorMittal Global R & D CFD and Thermo-Mechanics Days

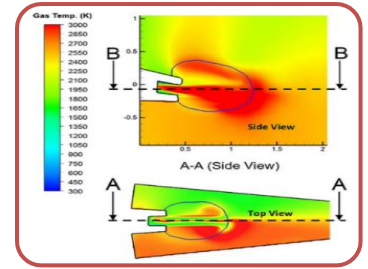
CIVS Director, Chenn Zhou, and students, Chukwunedum Uzor, Xipeng Guo, Yuchao Chen showcased CFD research achievements at the 7th ArcelorMittal Global R&D CFD & Thermo-Mechanics Days in February 2022 to share information about iron and steelmaking research with expert research colleagues across the world. [More](#)

Yuchao won the “Best Student Presentation” for his research on Electric Arc Furnace models. Chukwenedum and Xipeng received Recognition for Excellence. [More...](#)



Hydrogen Combustion Study Published in JOM

“Blast Furnace Hydrogen Injection: Investigating Impacts and Feasibility with Computational Fluid Dynamics” was published in the *Journal of the Minerals, Metals & Materials Society*, authored by Professor Tyamo Okosun, graduate student Samuel Nielson, and Director Chenn Zhou. It describes how the stability of blast furnace operation is impacted by low-carbon fuel injection and the limitations. [More...](#)



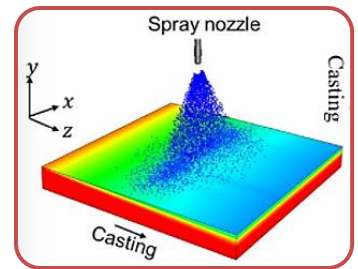
Three Invited Talks on Digitalization and Decarbonization by CIVIS Director

Dr. Chenn Zhou was recently invited to give three talks at 1) AIST Energy and Utilities Workshop at Oak Ridge National Laboratory in March; 2) Recycling and Waste Symposium collocated with TMS 2022 in Anaheim, California in February; and 3) SSAB Americas Strategy Summit in Rosemont, Illinois in February 2022. [More...](#)



Presentation at 23rd IAS Steel

CVIS researcher Haibo Ma and graduate research assistant Vitalis Anisiuba presented “Modeling of Air-Mist Spray in Continuous Casting of Steel” virtually at 23rd IAS Steel Conference in December 2021, which studies the effects of air pressure and casting speed on the heat transfer coefficient for the secondary cooling.



[More...](#)

NSF RET Teachers Influenced High School Students

Five students from Bishop Knoll visited CIVIS in March 2022 with their physics teacher Mrs.



Mary Koster who joined 2021 RET Summer Program. CIVIS projects were demonstrated [More...](#)

AR/VR Projects Presented at Two AIST Events



Kyle Toth, Senior Research Engineer, presented AR for Safety Training at the AIST Safety and Health Technology Committee meeting in February. [More...](#) Senior Research Scientist, John Moreland and Kyle Toth presented

Digital Twin and VR/AR Projects at the AIST Digital Transformation Forum for the Steel Industry in March. [More...](#)

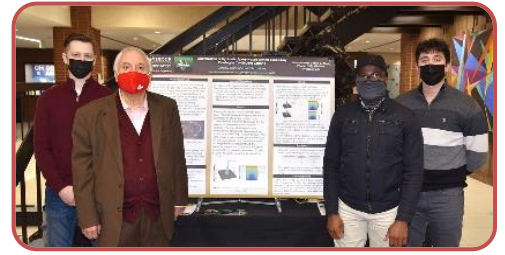
CVIS Seminar Series: Special Guest Speaker - Dr. Sunday Abraham

Over 50 PNW students, faculty, and staff attended CIVIS weekly hybrid seminar, on February 18th, 2022 for the special guest speaker, Dr. Sunday Abraham, the Director of SSAB Americas R&D. He gave a presentation titled “The Detrimental Effect of Hydrogen and Nitrogen on the Performance of Steel Products” had extremely positive feedback from CIVIS students. [More...](#)



CIVS Senior Design Students Receive Awards

CIVS senior students won the 1st and 2nd place in the Engineering Senior Design Poster Competitions in December 2021. [More...](#) 11 CIVS Senior Design students received the PNW Undergraduate Research Grants to support their research projects in March 2022. [More...](#)



NLMK Indiana Field Trip for Electric Arc Furnace

CIVS Researchers working on the Electric Arc Furnace (EAF) project visited SMSVC member company NLMK’s facility in Portage, IN in December 2021 to tour the plant and observe an EAF burner melting operation. [More...](#)



Plant Visits in Burns Harbor

Kyle Toth, Aleeha Zafar, and Yifan Fei visited the Cleveland- Cliffs Burns Harbor in February 2022, to gather more information on the AIST Digital Transformation project Caster Digital Twin. [More...](#) John Moreland and Myriam Changoluisa also visited Burns Harbor’s Deerfield training center in December 2021 to work on an Augmented Reality Lockout-Tagout-Tryout project with staff from Cliffs. [More...](#)

Die Casting at Chicago White Metal Casting



CIVS staff and students visited Chicago White Metal Casting, Inc. in December 2021 to gather information from the die caster related to melting furnace operations and maintenance for the ongoing

NADCA Virtual Die Casting Simulator development. [More...](#)



CIVS Students Recognized at AIST Chapter Meeting

21 CIVS staff & students and PNW faculty attended the AIST Midwest Chapter March Dinner meeting in Merrillville, Indiana with around 300 attendees from local industry. PNW faculty and students were recognized by the organizer, the keynote speaker Mr. Steven J. Henderson, the AIST President and the Vice President of the Western Region CMC in Arizona, and the AIST Executive Director Mr. Ron Ashburn. [More...](#)

Student Success Story: Vitalis Ebuka Anisiuba

Vitalis Ebuka Anisiuba, a Research Assistant at CIVS received his Masters’ degree in Mechanical Engineering with a thesis titled “Numerical Investigation of Air-Mist Spray Cooling and Solidification in the Secondary Zone during Continuous Casting” in December. Afterward, he joined INTEL Group in semiconductors. Vitalis said that “Working at CIVS gave me a once-in-a-lifetime opportunity to grow, it aided in the development of my critical thinking and engineering judgment.” [More...](#)



USS and Cleveland-Cliffs Safety Instructors Visit CIVS



Safety instructors from U. S. Steel Gary Works and Cleveland-Cliffs Burns Harbor’s Deerfield Training Center visited CIVS in November 2021 to record audio for mobile equipment safety training simulators [More...](#) as well as the progress of the ongoing Augmented Reality Maintenance and Safety Simulator (ARMSS) project. [More...](#)

U.S. Steel Hosts Researchers from CIVS and Purdue WL

CIVS and PUWL researchers came together in January 2022 to visit U. S. Steel Gary Works in Gary, IN. They visited blast furnace #14 for the \$7 million Integrated Virtual Blast Furnace (IVBF) project supported by the US Department of Energy, to develop a next-generation IVBF. [More...](#)



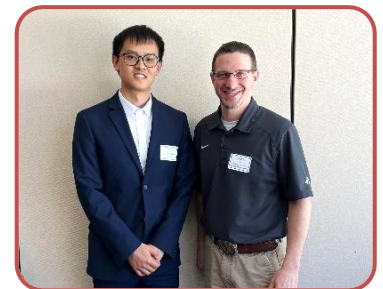
Two New Projects with Cleveland-Cliffs

CIVS kicked off the project “Study of Phenomena in the Cleveland Cliffs Toledo HBI Plant” in a virtual meeting in November 2021 with Cleveland-Cliffs Toledo team members on simulation of their HBI facility. [More...](#) In December 2021, CIVS kicked another project virtually with Cleveland-Cliffs Burns Harbor collaborated with M. N. Dastur & Company (P) Ltd to evaluate the use of higher H₂-content fuel mix in its boilers. [More...](#)



Invited Presentation at the AIST Ladle Committee Meeting

CIVS Ph.D. student Xipeng Guo was invited to present at AIST Ladle & Secondary Refining technology committee meeting in Virginia Beach, VA In March 2022. He presented some methodologies and results of the SMSVC consortium refining ladle project. [More...](#)



Facts and Impact (Since 2009)

- \$40+ million savings for companies
- \$35,250,000+ in external grants and contracts
- 170+ external organizations collaborated with CIVS
- 410+ projects
- 640+ national and local news
- 1,770+ students employed and mentored
- 11,450+ students used CIVS for virtual labs
- 150+ Purdue Northwest faculty and staff collaborators
- 290+ student awards and grants (globally, since 2011)
- 36,000+ local and global visitors



SMSVC NOTES

Semi-Annual Meeting
April 20 - 21, 2022

SMSVC Accepting New Members

SMSVC is accepting new members. If interested in becoming a member, please contact steelcons@pnw.edu

For more information on the Consortium, visit steelconsortium.org.