

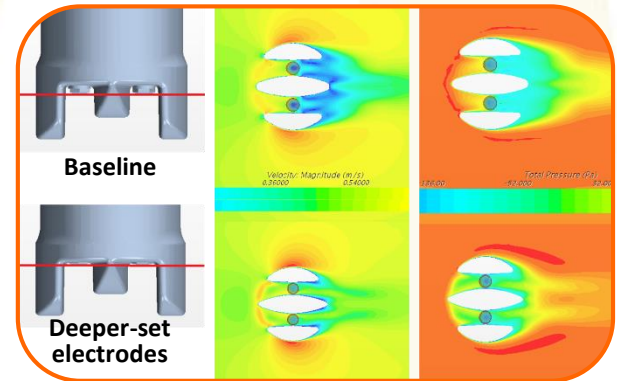


## Dwyer and CIVS Collaboration Produces Fundamental Insights and Practical Benefits

In June of 2018, engineers at Dwyer Instruments in Michigan City, Indiana, implemented a “simple modification to current parts” that had taken nearly three months of CIVS collaborative research alongside Dwyer professionals to arrive at—and the results surpassed all expectations.

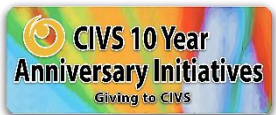
“I was amazed by how quickly the problem was solved and the significant improvement this will have on our ability to manufacture our Insertion Magmeter going forward,” said Bob Moss, Director of Engineering and New Product Development at Dwyer. “I shared my excitement with our senior team and emphasized how important this collaboration is to Dwyer. Without the alliance with PNW’s CIVS, we could have encountered significant challenges in manufacturing this product.”

The phenomenon under investigation involved an output reading (a “K-factor”) from an insertion electromagnetic flow meter (or magmeter), a device that can be installed into pipes to measure the fluid velocity of conductive liquids such as water. Dwyer engineers had, through much experimentation, observed an unexpected decrease in the K-factor that could result in nonrepeatable readings, increasing the difficulty of automatic calibration to precise measurement. [Read more ...](#)



CENTER FOR INNOVATION THROUGH VISUALIZATION & SIMULATION

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## Virtual Reality Collaboration Advances Forensic Science Training

Charles Steele, (Albert) Karl Larsen, and Daniel Suson are not professional crime scene investigators (CSIs), nor do they play them on TV. They are, however, professional educators with a great deal of collective expertise in forensic science and forensic science training; they help *instruct* crime scene investigators; and in collaboration with PNW’s Center for Innovation through Visualization and Simulation (CIVS), the three have produced and are “going public” with what may be the next generation in CSI training: an immersive, 3D virtual reality training environment and program, in which users must properly locate, identify, and collect evidence in a way that would be legally acceptable in the real world. [Read more ...](#)



## CVIS Researcher Wins 2nd Place at International AISTech 2018 Competition



CVIS research assistant and recent PNW graduate Bethany Worl received 2nd place in the international Undergraduate Student Paper Presentation at AISTech 2018 on May 7, 2018, for her paper “Analysis of Steel Oxidation Inside of a Reheating Furnace.” AIST Foundation

President Kolin Keller (L) and Kevin Bort (R) presented the award at the Steel to Students Reception in the Liberty Ballroom at Philadelphia’s Pennsylvania Convention Center. [Read more . . .](#)

## Engineering Senior Design Teams Reap Awards



Two CIVS-associated student research teams received awards for their senior design II presentations on Friday, April 27, 2018, at the PNW-Hammond campus.

Aaron Morgan and Edwin Mosquera won 2nd place for their work, “Simulation and Analysis of the Unilever Glue Nozzle Dispenser” ([read more](#)), while a total of **39 teams** and **123 students** from the PNW School of Engineering delivered presentations during the day-long event. [Read more . . .](#)

## Zhou Highlights Smart Steel, Research Technologies at 3 International Conferences



SMSVC and CIVS Director Dr. Chenn Zhou’s spring/summer 2018 research dissemination globetrot began with an invited lecture and presentation, “Blast Furnace Visualization and Modelling,” at the 25th McMaster University Blast Furnace Ironmaking Course in Hamilton, Ontario in May ([read more](#)); continued with delivery of two technical papers at the 2nd International Symposium on the Recent Developments in Plate Steels in Orlando, Florida on June 3-6 ([read more](#)); and concluded with another invited lecture and panel participation at Future Steel Forum: Industry 4.0 in Warsaw, Poland on June 7-8. After delivering “Simulation,

Visualization, and Data Analytics for Smart Steel Manufacturing” to nearly 200 Future Steel fellow attendees, Zhou facilitated panel discussion on Engineering Education and Qualifying the Industry 4.0 Workforce. [Read more . . .](#)

## Wind Energy Workshop Uplifts Advanced Technology Training

On June 5-6, 2018, CIVS’s John Moreland and Kyle Toth viewed new repair and inspection techniques, advanced materials application, and manufacturing and training processes in wind energy, and presented at the NREL Advances in Wind Energy conference in Boulder, Colorado. Through recognition gained from previous NSF ATE wind energy project work and conferences, the CIVS researchers were invited to the two-day workshop, which was hosted by the NREL’s Institute for Advanced Composites Manufacturing Innovation (IACMI). [Read more . . .](#)



## Spotlight on Faculty: Dr. Michael (Manghui) Tu



Michael Tu is an Associate Professor of Computer Information Technology and Director of the Center of Excellence for Cyber Security & Infrastructure Protection at Purdue University Northwest. Through an NSA CAE Cybersecurity Workforce Education Grant and NSF support, and in collaboration with CIVS and co-PI Chenn Zhou, Dr. Tu has been able to focus on developing an immersive learning pedagogy for high school cybersecurity education and host the GenCyber High School Summer Camps at PNW. “CIVS provided much-needed expertise for the virtual reality game development and assessment areas that were crucial to these projects,” Tu noted. “We hope to expand the reach and influence of the GenCyber camps in years to come.”





## Calumet Area Industrial Commission Explores CIVS-Industry Innovations

Around 40 members of the Calumet Area Industrial Commission, including small-business owners and development thought-leaders, toured CIVS and CMEC facilities on Thursday, May 31, 2018, looking for ways in which innovative and/or emerging technologies might be useful to them, to business associates, and to the Calumet region. [Read more ...](#)

## PNW/Enbridge Engineering Camps “Wow” Students

A pair of week-long engineering summer camps, held at PNW-Hammond June 11-15 (middle school) and 18-22 (high school), led students through a succession of mini-courses that began with an introduction to CIVS integration of 3D visualization and simulation technologies and included topics such as V-8 engine (model) assembly, bridge building, nanotechnology, surveying instruments and methodologies, and field trips to facilities that showed students real-world examples of engineering in action. [Read more ...](#)



## CIVS Initiatives Engage Region Middle Schoolers ...

More than 80 northwest Indiana middle-school students and their teachers visited CIVS facilities and took in a range of simulation and visualization projects, during an Educational Talent Search “Day on Campus” tour on May 22, 2018. [Read more ...](#)



## Graduate Research Assistant “Classes Up” Camp Leo Event

CIVS graduate researcher Justin Heffron brought true class to the inaugural Camp Leo “college preparatory experience” for region high school students, held June 26-27, 2018, at the PNW Hammond campus. In fact, he *created* a one-session “Intro to 3D Modeling” class. [Read more ...](#)

## and Boost GenCyber High School Summer Camps



The PNW College of Technology’s GenCyber Summer Camps, held June 11-15 and 18-22, 2018, provided region high school students with hands-on experience in cybersecurity fundamentals and training, robot game design, cyber forensics, ethical hacking, and more. [Read more ...](#)

## Student Success Story: Edwin A. Mosquera



After a presentation-heavy April 2018, during which he participated in PNW Discovery Day and Engineering Senior Design competitions, Edwin Mosquera graduated from Purdue Northwest in May 2018 with a B.S. degree in Mechanical Engineering. He joined CIVS as a graduate research assistant in June 2018 and says of his mentor, Haibo Ma, “Haibo has been showing me what purely **good** work is about. His methodical approach to CFD analysis, the way he presents investigations in PowerPoint—I hope to absorb these ways and become more efficient and effective in my own work.” Citing his own leadership development as president of PNW’s ASME student chapter, Edwin hopes to provide growth and self-initiative opportunities for others in the future; for now, he plans to pursue an M.S. in Mechanical Engineering at PNW.

## SDI Tour Helps Refine Safety Simulators

CVIS Senior Research Scientist John Moreland and graduate research assistant Zhaoyang Li toured Steel Dynamics, Inc.'s flat-roll steelmaking complex in Butler, Indiana on May 16, 2018, as part of a scheduled maintenance day at the facility. The tour, hosted by SDI's Yury Krotov and Garrett Page, allowed CVIS researchers to view and learn more about lockout/tagout and confined space safety procedures and real working conditions in the facility. [Read more ...](#)



## CVIS Sojourn Expands Italian Trade Agency's Tech Worldview

Fourteen members of the Italian Trade Agency (ITA), including representatives from leading Italian manufacturing associations and faculty from the polytechnics of Milan and Turin, toured CVIS facilities and explored possible opportunities for collaboration and educational/manufacturing advancement, on June 28, 2018. After an overview of CVIS's 10-year history of projects, delegates took in technology demonstrations, walk-throughs of VR environments, and in-depth engineering discussions, courtesy of CVIS researchers Haibo Ma, Bethany Worl, and Justin Heffron. [Read more ...](#)



## Gary Works Visit Features Hot Strip Mill

On June 22, 2018, U.S. Steel-Gary Works Operational Exc. Specialist Aldo Lopez "turned the tables" on select CVIS members, treating the CVIS team of John Moreland, Armin Silaen, and John Estrada both to a tour of U.S. Steel's 84" Hot Strip Mill/Roughing Mill facility and to a "safety" PowerPoint presentation and kitting out with appropriate personal protective equipment for the tour. The tour began at the primary end, viewed the blast furnaces, melt shops, and casters, and centered on the hot strip mill, with a catwalk tour of the roughing mill. [Read more ...](#)



## Praxair Tour Aerates Research Progress

Information exchange, research and project appraisal, and process immersion were among the accomplishments of a June 20-21 tour of Praxair facilities and headquarters in upstate New York, where CVIS Director Dr. Chenn Zhou, Senior Research Scientist John Moreland, and Dr. Tyamo Okosun delivered presentations on a variety of simulation- and visualization-based projects and Consortium accomplishments. [Read more ...](#)



### SMSVC NOTES

#### Fall 2018 Annual Meeting Scheduled for November 14-15, 2018

The AIST Dinner will be on November 13.

For more information, please contact us at [civs@pnw.edu](mailto:civs@pnw.edu)

#### SMSVC Accepting New Members

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

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

## Facts and Impact (Since 2009)

- \$40+ million savings for companies
- \$17,300,000+ in external grants and contracts
- 110+ external organizations collaborated with CVIS
- 350+ projects
- 390+ national and local news
- 1,490+ students employed and mentored
- 9,950+ students used CVIS for virtual labs
- 110+ Purdue Northwest faculty and staff collaborators
- 129 student awards and grants (globally, since 2011)
- 30,800+ local and global visitors