

BC XR LAB

2022/2023 ANNUAL REPORT



AI Enhanced Virtual World - Maria Sanchez-Isaza, XR Lab Visiting Scholar from Columbia

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EXECUTIVE SUMMARY

This report is written in September 2024, and summarizes activities, projects, workshops, grants, and other initiatives taking in place in the XR Lab from September 2022 through August 2023.

The XR Lab continues to be a high functioning organization within eLearning, pursuing a variety of projects, and will begin its seventh fully operational year within the college. A few of the highlights of this past academic year since our last report include:

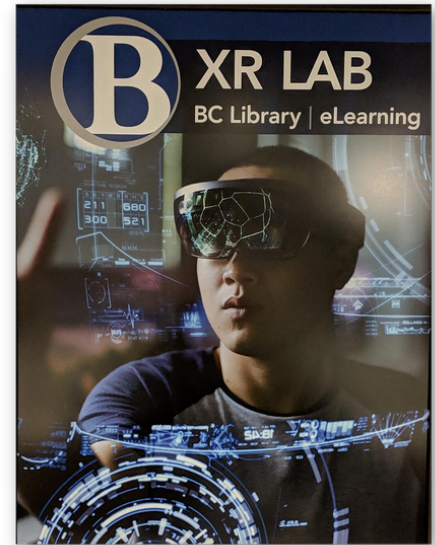
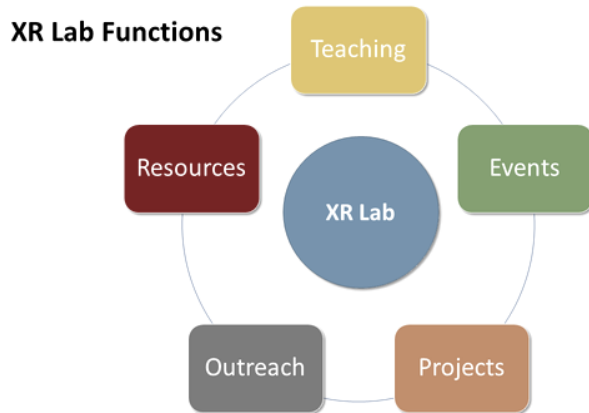
- eLearning and XR Lab integration
- Federal grants awards
- XR Lab and student Capstone Team Projects collaboration (Computer Science & Interior Design)
- XR Lab hosted events and workshops
- Virtual Reality Design and Communication course
- Institutional networking and Open Education Resources (OER) initiatives
- Artificial Intelligence symposia and workshops
- The *XR Lab* podcast
- Visiting scholar program
- XR industry partnerships
- Student interns
- VR Student Club

Core XR Lab Mission & Functions

Bellevue College XR Lab Mission

To explore the equitable use of XR technologies for teaching and learning

Bellevue College XR Lab Functions



Core functions of the XR Lab are the following:

- 1) **Teaching:** VR classes, workshops, capstone projects, internships, mentoring
- 2) **Events:** Presentations, seminars, panels, guest speakers, game jams
- 3) **Projects:** Virtual tours, teaching environments, new XR technologies, videos
- 4) **Outreach:** XR Networking, schools, libraries, industry, visiting scholars
- 5) **Resources:** XR hardware & software, consulting, curriculum, WA State OER

XR or “Extended Reality” is a term that encompasses Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). These technologies are forms of spatial computing, which means they allow users to interact with digital objects and avatars in three-dimensional virtual spaces.



XR Lab Staff: 2022-2023



Aung Thaug: Lab Assistant

Raji Sundar: Instructional Designer

Ron Austin: Administrator - Producer

Larry Boykin: Media Management

David Wikstrom: Sr XR Lab Tech Specialist

Jon Thaler: Lab Assistant

Maria Sanchez-Isaza: Visiting Scholar

Berke Can: Lab Assistant

James Riggall: Visiting Scholar

Bruce Wolcott: Faculty Lead

One of the unique features of the XR Lab is that all staff members are part-time employees. This year, we received a grant from the National Science Foundation which will provide funding for our first full time XR Lab administrator, as well as an OER Librarian, curriculum developer, and additional part-time student employees. Up until now, we've divided our lab tasks among Bellevue College faculty and staff, visiting scholars, part-time employees, volunteers, as well as interns.

The XR Lab Team meets once a week to assess progress. Tasks are divided up into the following categories: administration, project development, networking, teaching, advising, curriculum development, inventory management/maintenance, events hosting, XR technologies exploration, VR Student Club, and social media. Members divide their work time between a blended on-campus and online engagement.

This staffing structure provides maximum flexibility and adaptability to a changing XR technology landscape.



XR Lab and eLearning Integration

This year for the first time, the eLearning Center and the XR Lab were formally integrated for the first time. While eLearning focuses on training faculty to use the Canvas course management system, the XR Lab explores 3D spatialized computing, AI, and multi-user virtual environments. Both departments aim to improve online teaching and learning at Bellevue College.

The integration of these two departments responds to the growing trends of online education. Students are increasingly using various online resources for learning, not just traditional classrooms. By combining the eLearning Center's expertise in Web-based course management along with the XR Lab's work in spatial computing technologies, we aim to offer a more diverse range of online educational tools. We believe this move strengthens our shared goal of adapting to the changing educational landscape.



Planning meeting at the Bellevue College eLearning Center

XR Lab Federal Grants - Part 1

Probably the biggest XR Lab news for the 2022-2023 academic year was receiving two US Federal Grants awards which are both being launched in October, 2023. These grants, which both involve a collaborative effort among several Bellevue College departments, will engage the XR Lab in important roles.

Project Title:

From Virtual to Reality in Humanities: Understanding the Story of War in Normandy

Granting Agency:

U.S. Department of State, \$35,000 - Duration: 1 year

Increase and Diversify Education Abroad for U.S. Students (IDEAS)

Description:

From Virtual to Reality in Humanities: Understanding the Story of War in Normandy

This grant will involve students in building a virtual tour to recreate their travel experiences in Normandy, France, and to share these with other students unable to make the journey. This intercultural program tackles barriers to study abroad for minority and disabled students using VR tech. It aligns with the U.S. State Department's focus on Technology and Innovation, helping students see XR's broad educational potential.

St. Rochelle Virtual Tour Prototype: IDEAS Project Screenshot



XR Lab Federal Grants - Part 2

Project Title:

Northwest Open XR Initiative

Granting Agency:

National Science Foundation \$763,482 - Duration: 3 years

Description:

The XR Lab's main goal within the Northwest Open XR Initiative project is to create a regional virtual, augmented, and mixed reality (collectively referred to as Extended Reality or XR) program to serve as a training and resource hub for higher education institutions, especially community and technical colleges in the Pacific Northwest and beyond. This hub will increase access, training, and adoption of XR for teaching and learning in higher education, and help train students in relevant skills to meet industry needs, as XR is more widely adopted.

This network will serve to expand and strengthen an existing XR-based educational learning community, and invite increased participation to develop open source curricula with the aim of resource sharing among institutions and programs.

Northwest XR Educational Network Members



Bruce Wolcott

XR Lab Faculty Lead / Instructor
Bellevue College
Washington



Carolina Rose (she/ella)

Instructional Technology Specialist
Portland Community College
Oregon



Monica Marlo M-G

Immedgineer
Portland Community College
Oregon



Sage Freeman

Instructional Media Specialist
Chemeketa Community College
Oregon

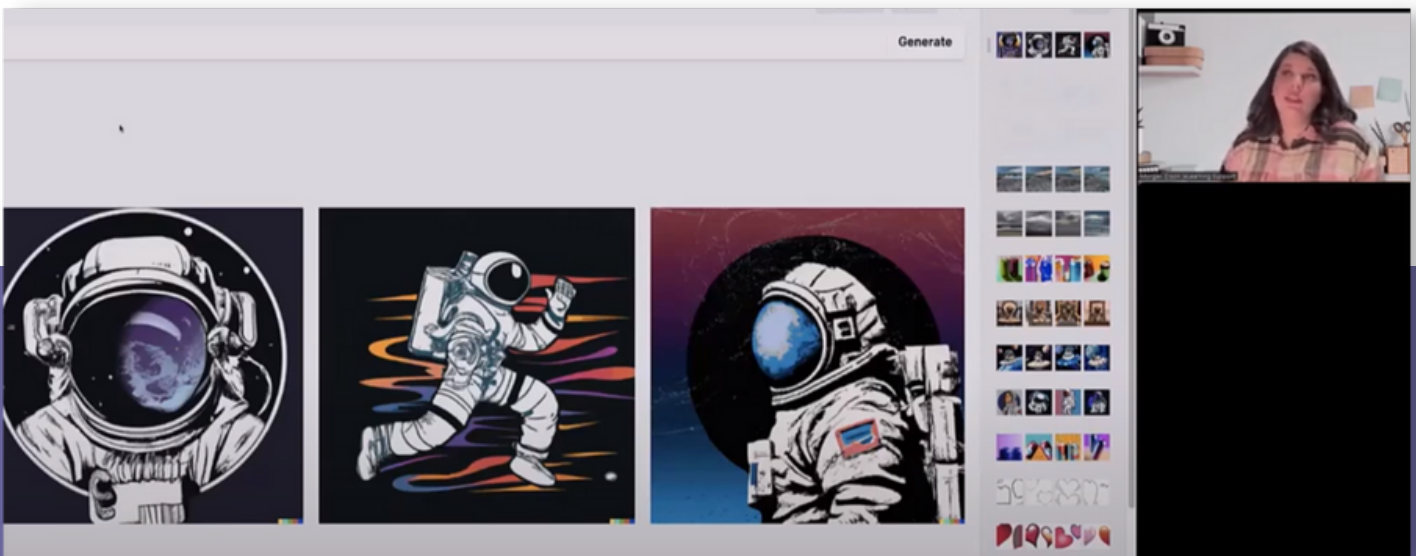
XR Lab Events

In the academic year running from September 2022 to August 2023, the XR Lab hosted numerous workshops, podcasts, class sessions, and events. During this period of time 1578 students, faculty members, administrators, and Bellevue College visitors visited the lab to join in these activities.

As an example, one of the most well attended events was a four-part online discussion on the new generative artificial intelligence programs that were first introduced to the public in November 2022. It immediately became apparent that these new AI tools will have a profound effect on how we teach, learn, as well as administer our educational institutions. Many faculty expressed their concern that AI will make it possible for students to easily generate written content and cheat on exams, while others expressed the opinion that we need to adapt to these powerful new technologies by changing our teaching strategies.

The XR Lab, along with eLearning, is planning to continue to teach faculty and students about AI applications and ethical considerations while using these tools.

XR Lab & eLearning Generative AI Workshop | Morgan Olson



Virtual Reality: Design and Communication

Every Winter Quarter the XR Lab hosts the 5 credit CMST 116 course called *Virtual Reality: Design and Communication*. In this course, students learn all about virtual reality (VR) and the variety of virtual worlds that can be experienced using this technology. The course covers the history of VR, the relationship between VR and other mixed reality technologies, design considerations, communications, artificial intelligence, hands-on projects as well as social and ethical implications of immersive technologies.

One of the main features of this course are weekly presentations from a variety of XR technology experts, including simulations creators, game programmers, hardware marketers, psychologists, scientific visualizations designers, AI engineers, and other industry professionals. Many of these guest speakers appear remotely from locations outside of Washington State though a live video projector presentation screen in the XR Lab theater classroom.

CMST 116 integrates hands-on learning together with up-to-date exposure to the latest developments in the XR industry. The course is taught by Bellevue College instructor Bruce Wolcott and visiting University of Tasmania scholar, James Riggall.

Polyarc VR programmer Brendan Walker leads a seminar



The XR Lab along with the Bellevue College Computer Science department continues to build upon a successful capstone project concept that was initiated in Winter/Spring 2021. This concept puts students who are working in capstone project teams under the mentorships of an industry partners - in this case Seattle-based VR company MXTReality where they must complete 6 month project-based solutions for real-world scenarios.

I. VR Simulations. Computer Science capstone teams worked on interactive virtual reality projects.

- **Faculty Lead:** Pete Ophoven (Computer Science)
- **Industry Client:** Jeff Rayner, CEO of MXTReality
- **XR Lab Advisor:** David Wikstrom of MXTReality



Team member demonstrates disabilities snowboard simulation to MXTReality CEO Jeff Rayner

II. Interior Design Immersive Visualizations Capstone Project Demos

The XR Lab collaborated with the Bellevue college Interior Design Department, where fourth year students presented their capstone projects within immersive walkthrough virtual environments, using VR headsets.

Faculty Lead: Diane Dieterich



Wheelchair accessibility floorplan design project - Bellevue College Interior Design

An important foundation for the XR Lab is the role of student initiative and engagement with running the XR Lab. Active participation on the part of students either as part-time hires or work-study employees is vital to the lab's success. We're always on the lookout for highly motivated students who 1) have a passion for virtual reality technologies, and 2) proactively participate in the day-to-day operations of the facility. We've had great success so far using this formula for new team recruits.

One of the primary responsibilities of our student team members is managing the organization and activities of the Virtual Reality Student Club on campus. They promote the club's events, and host weekly gatherings. XR Lab assistants Aung Thaug, Berke Can helped boost interest and participation in the XR Lab by building membership in the VR Student Club

VR Club members use VR Gear



VR Club Collaboration



The XR Lab is making plans to continue our current roles and projects for the upcoming academic year in 2023-24. Shown below is a brief overview of several areas of development that we have in the pipeline.



The XR Lab will be collaborating with Digital Media Arts to complete the first year of a three year NSF grant to: "...create a regional virtual, augmented, and mixed reality program that serves as a training and resource hub for community and technical colleges in the Pacific Northwest."



The XLab Team will continue to explore emerging XR hardware and software, specifically in following areas: shared networked 3D teaching environments, generative artificial intelligence, drone photography, augmented reality, 360 photography, and streaming media podcasting.



Part of the core mission of the XR Lab is to engage students in a variety of XR Lab projects and essential tasks: equipment maintenance, Student VR Club hosting, software testing, events support, and project development.



Virtual reality classes will be hosted by instructors on numerous display platforms - VR headsets, laptops, desktops, smart phones and tablets. These experiences can be networked to engage many participants in virtual worlds. We also plan to teach the Virtual Reality 5 credit course in the reopened XR Lab theater space.



The XR Lab will continue to develop a multicultural communications program in collaboration with Bellevue College faculty member Li Liu who is travelling to France with a group of students to document their travel experiences there within a virtual tour. This project is funded by the US State Department IDEAS program.



One of the XR Lab's goals for the coming 2023-2024 year is to host public virtual and on-campus events in venues such as the Spatial IO multiuser online environment, which provides gallery spaces and meeting areas for networked planning and information exchange.



The XR Lab has been working with Open Washington Network administrator, Boyoung Chae. She offered the XR Lab specific areas on the OER website to publish XR curricula along with related links to virtual teaching spaces available on an open source basis.

2023/2024 BUDGET

Due to campus-wide financial cuts, we received a reduced budget amount for the 2022/23 financial year. Despite a slow campus return to pre-pandemic enrollment levels, the XR Lab continues to rebuild our on-campus presence and maintain cost-conscious practices as we've done in the past. We also expanded our capacity for outreach by successfully replacing our team staff that had been reduced due to departing student employees.

In the next fiscal year we are planning to bring back James Riggall to work as in a valuable administrative advising capacity as he's done in the past. In the coming year, we'll be focusing on further developing capacity in staff and student workers, increasing our industry outreach efforts, extending XR Lab services across the campus through student and faculty outreach programs.

As mentioned earlier in this report, the XR Lab successfully participated in the development of two XR based grant awards, one for the U.S. State Department IDEAS program (\$35,000), and the other for the National Science Foundation (\$763,482) - which will provide funds to the XR Lab for three years, starting in October 2023. Both of these awards represent a promising start to the 2023-2024 academic year.



Special thanks to the XR Lab
Budgetary Angel - Christa Jech

2021/2022 BUDGET*

Item	Cost
XR Faculty Lead:	24,000
Instructional Design XR Specialist:	24,000
Student Employees (2):	10,000
Faculty Project Stipends:	6,000
<hr/>	
Total:	64,000
Goods & Services	3,000
Software	2,500
Hardware	5,000
Marketing	1,000
Conferences & Presentations	1,200
Contingency	2,000
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Total:	14,700
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Total:	78,700