



EMERGING MEDIA LAB

2023 UPDATE

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INTRODUCTION

UBC's Emerging Media Lab (EML) began with a direct connection to UBC's strategic vision of transformative learning. An innovation hub on campus, the EML unites faculty, staff, students and industry from all disciplines to experiment with new technologies such as virtual reality, artificial intelligence, and machine learning.

Shortly after its inception, the EML gained recognition. It was the winner of the [2018 CUCCIO Innovation Award](#), which celebrates innovative IT projects within Canadian higher education institutions. Some of the EML's projects have also been highlighted in the Horizon Report, Educause's influential annual publication detailing IT trends in higher education.

Over the past couple of years key projects such as [HoloBrain](#) and [3D Metabolism](#) revolutionized learning through augmented and virtual reality. The EML team also expanded, opening a new location at the Irving K. Barber Learning Centre in collaboration with the Centre for Teaching, Learning and Technology, UBC Library and UBC IT.

When the university made the move to online teaching for the vast majority of programs in March 2020 due to the COVID-19 pandemic, the EML was no exception. The team worked to pivot as many activities as they could to a virtual format. One example is the Showcase, a bi-annual event highlighting the impact of the EML's work. While the physical lab space itself had to close to the campus community, the team displayed remarkable resiliency by continuing to develop projects online and preparing for start of the 2021/22 academic year, when faculty, staff, and students were welcomed back to campus.

Regardless of your role at the university, we invite you to visit the EML in person and explore this exciting space where problem-solving and creativity thrive.

Jennifer Burns
Associate Vice-President, Information Technology
Chief Information Officer

Simon Bates
Associate Provost, Teaching and Learning





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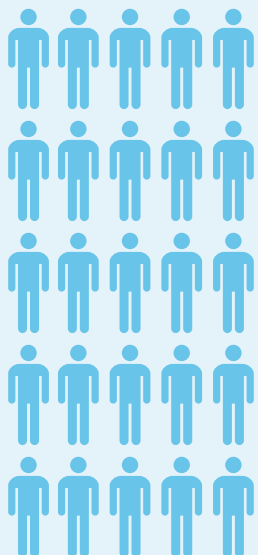
TOTAL PROJECTS

196

STUDENTS

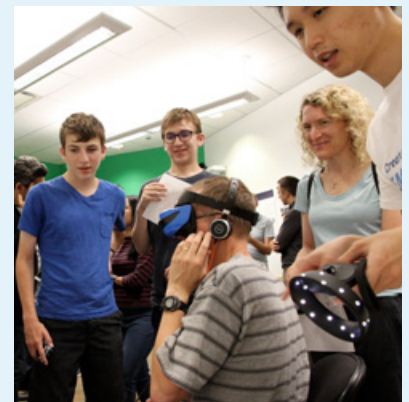
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FACULTY IN
RESIDENCE
AND PRINCIPAL
INVESTIGATORS



NUMBER OF PROJECTS BY THEME

- 39 Experiential Learning
- 14 Virtual Reality
- 13 Augmented Reality
- 12 Data Visualization
- 12 Web-based
- 6 Machine Learning / Artificial Intelligence
- 5 Minimum Viable Products
- 6 Representing Large Scale Environments
- 6 Immersive Storytelling
- 5 Minimum Viable Products
- 4 Biosensing
- 1 Artificial Intelligence
- 1 Generalized Tool



BACKGROUND

In late 2015, a group of staff and faculty began a conversation about bringing immersive technologies such as virtual reality to UBC in a teaching and learning context. An augmented reality/virtual reality working group was established and UBC Studios created a VR Lab where faculty and staff started collaborating with students through the AMS Game Development Association (AGDA) on creating UBC's first educational VR projects such as Geography VR with funding support from BC Campus and UBC's Teaching, Learning Enhancement Fund (TLEF).

In 2016 a proposal to create an exploration and incubation hub for emerging media and technology for UBC with support from faculty and staff who pioneered in use of technology in education was presented at UBC CIO. Through collaboration with Centre for Teaching, Learning and Technology, UBC IT has assigned annual funding for creation of the Emerging Media Lab at UBC. In March 2017, UBC's Emerging Media Lab's (EML) was officially established under UBC Studios and a few months later, EML opened its first independent location in the Neville Scarfe Building in July 2017.



2018 CUCCIO INNOVATION AWARD

The 2018 Innovation Award was awarded to the University of British Columbia's Emerging Media Lab.

<https://www.cuccio.net/en/initiatives/cuccio-awards/12-initiatives/165-celebrating-last-year-s-finalists-2018.html>

EML's mission is to work collaboratively with faculty, staff and students from across all disciplines to experiment with ways in which emerging technologies, such as virtual reality, augmented reality, artificial intelligence and machine learning, can be brought into the classroom to enhance teaching and learning.

Over the past six years, Emerging Media Lab has grown into a 63-member group consisting of faculty, staff and students across all disciplines. EML has developed over 45 immersive, machine learning, and visualization projects for educational purposes, some of which have been showcased at events throughout the lower mainland, including Siggraph, the BC Tech Summit, VR/AR Global Summit, VancouVR, and more. In September 2018, Emerging Media Lab expanded its monthly Emerging Media Community of Practice to encompass other educational institutions, including Simon Fraser University, the Center for Digital Media, Emily Carr University, Kwantlen Polytechnic University, and University of Victoria.

In collaboration with UBC Library, Centre for Teaching, Learning and Technology, and UBC Information Technology, Emerging Media Lab officially opened its second location in March 2019 at Irving K. Barber Learning Centre. Located in the heart of campus, this location is being used for outreach events, as well as bookable lab space for UBC courses while the Neville Scarfe location is the development space for EML.

VISION

EML is an experimental hub for the University where faculty, students and staff from all different disciplines collaborate with industry and community to design the future of education. Its mission is to evolve learning by creating tools and techniques using emerging media and technology including Augmented and Virtual Reality.

EMERGING:

Technologies and techniques that are not commonly used yet, but that may become critically important in the future

MEDIA:

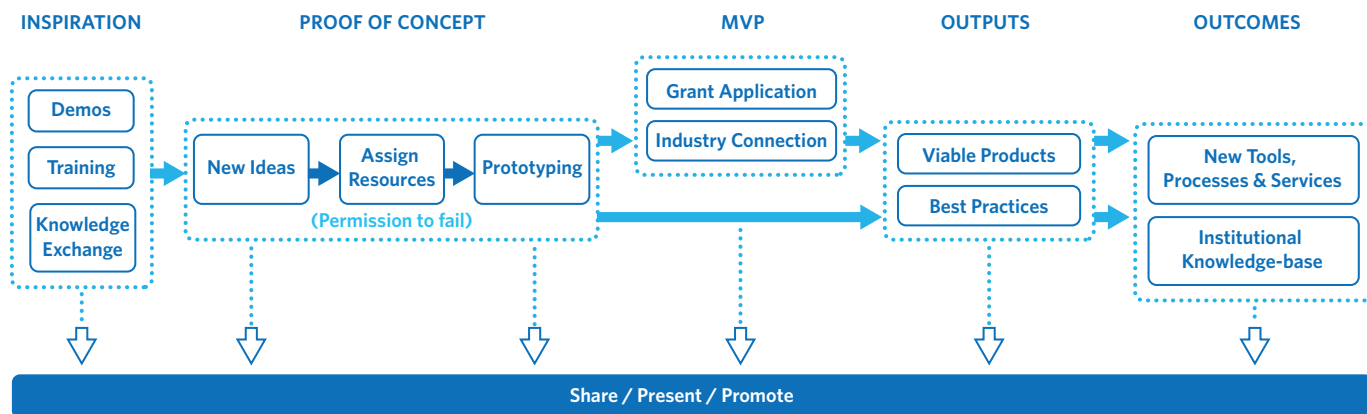
The combination of computing and communication

LAB:

Where experimentation goes hand-in-hand with permission to fail

PROCESS

At EML, FAIL means First Attempt In Learning.



INSPIRATION: Conversation and dialogue paves the way for demos, training and knowledge exchange to be had.

PROOF OF CONCEPT: Resources are assigned to new ideas and a rapid prototyping process starts until the project reaches a proof of concept (or not). With a permission to fail, this phase could repeat as many times as necessary. Regardless of the outcome the process and lessons learned are documented and shared.

MINIMUM VIABLE PRODUCT (MVP): Once a working prototype is built, select projects are pushed forward through external grants or industry partnership.

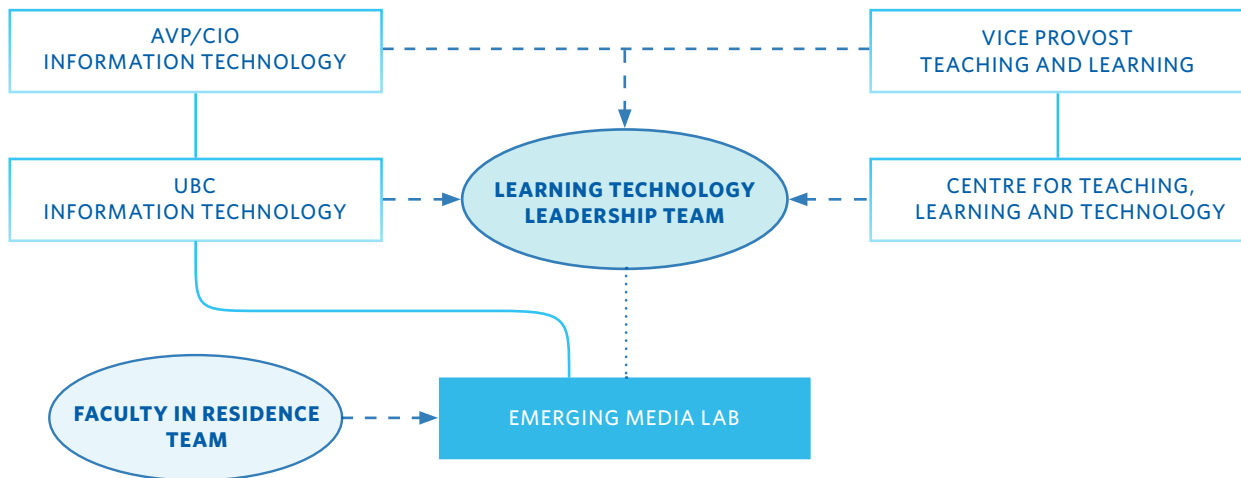
OUTPUT: By default all projects created in EML are open source, available and accessible for the public. If the project produces a viable product, it will be made available publicly and best practices are documented and shared publicly as well.

EML GOVERNANCE

The Emerging Media Lab (EML) is a unit under UBC IT, under the leadership of UBC Studios' Executive Producer.

The strategic direction for EML is provided by AVP Information Technology (CIO) and VP Teaching Learning through the Learning Technology Leadership Team, which also includes Senior Leadership members of both UBC IT and CTLT.

The academic direction for EML currently is provided by a group of interdisciplinary faculty members from across University who are appointed by their department heads as faculty in residence at EML.



PEOPLE

Collaboration is essential at EML. Below are the groups of people that support and make up EML.

Faculty

Faculty in Residence

Faculty members who have been appointed by their departments as academic members of EML have complete access to its resources. They act as academic advisors and mentors for EML teams and work on EML projects or support EML activities.

Principal Investigators

Principal Investigators are key members of EML projects who act as a subject matter experts for that particular project. Principal Investigators can also be faculty in residence and vice versa.

Collaborating Faculty

Besides acting as FIRs or Principal Investigators, faculty members can take on the role as a Collaborating Faculty Member. As a Collaborating Faculty Member, they support EML with their own lab equipment expertise or more.

Staff

The staff at EML are under the leadership of UBC Studios' Executive Producer. EML currently has a staff supervisor, a software developer, emerging media mentor, and a coop student serving as lab coordinator, as well as support from UBC Studios staff.

Staff Liaisons

A number of units have appointed staff to act as a liaison between their department and EML to provide support when necessary. The following is our current list of units with staff liaisons.

- » Vantage College (Curriculum and Education Technology)
- » UBC Information Technology
- » UBC Arts ISIT (Educational Technology)
- » Centre for Teaching, Learning, and Technology (CTLT)
- » Educational Technology Support (ETS)
- » Faculty of Medicine (Educational Technology)

Student Team

The Student Team is comprised of Co-op students, Work Learns and volunteers.

Work Learn students have been the core of project development at EML. Some Work Learns provide administrative support (e.g., marketing, event planning, and tours), while others work as leads on projects (e.g., project coordinators, technical leads and design leads).

Volunteers dedicate at least five to ten hours every week to help out with the current projects at EML. Some students come with programming experience, 3D modelling experience, UX/UI experience and others come with an interest to learn.





People

- » Dr. Patrick Pennefather
Department of Theatre and Film
- » Jon Festinger
Peter A. Allard School of Law
- » Dr. Lindsay Rogers
Biochemistry and Molecular Biology
- » Dr. Matthew Yedlin
Department of Electrical and Computer Engineering
- » Dr. Cinda Heeren
Department of Computer Science
- » Dr. Steven Barnes
Department of Psychology
- » Dr. Suzie Lavallee
Faculty of Forestry
- » Dr. Melanie M. Wong
Department of Language and Literacy Education, Faculty of Education
- » Dr. Sid Fels
Department of Electrical and Computer Engineering
- » Dr. Alan Kingstone
Department of Psychology
- » Dr. Joseph Anthony
Department of Physical Therapy, Faculty of Medicine
- » Dr. Paul Pickell
Department of Forest Resources Management, Faculty of Forestry
- » Christine D'Onofrio
Department of Art History, Visual Art and Theory
- » Dr. Bernie Garret
School of Nursing

Collaborators

With the continuous and unwavering support and knowledge from the following partners and collaborators, EML continues to offer its services to the UBC community.

UBC Internal partners

- » UBC Studios
- » UBC Information Technology
- » Centre for Teaching and Learning Technologies (CTLT)
- » Arts Instructional Support and Information Technology (Arts ISIT)
- » Advanced Research Computing
- » Vantage College
- » Department of Geography
- » Department of Theatre & Film
- » Faculty of Education
- » School of Creative Writing
- » Department of Art History, Visual Art & Theory
- » Department of Psychology
- » Faculty of Medicine
- » School of Journalism, Writing, and Media
- » Department of Electrical and Computer Engineering
- » Peter A. Allard School of Law
- » Department of Sociology
- » Faculty of Microbiology and Immunology
- » Department of Anthropology
- » School of Nursing
- » Faculty of Land and Food Systems
- » Faculty of Forestry

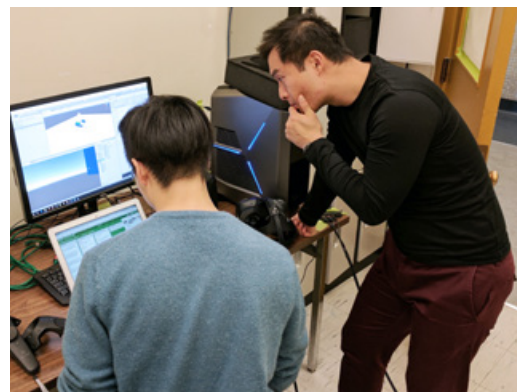
» Faculty of Dentistry

» UBC Game Dev

» Blockchain @ UBC

External collaborators

- » Microsoft Corporation
- » Centre for Digital Media
- » Kwantlen Polytechnic University
- » Simon Fraser University
- » Vancouver Coastal Health
- » Metanaut VR
- » The Sawmill



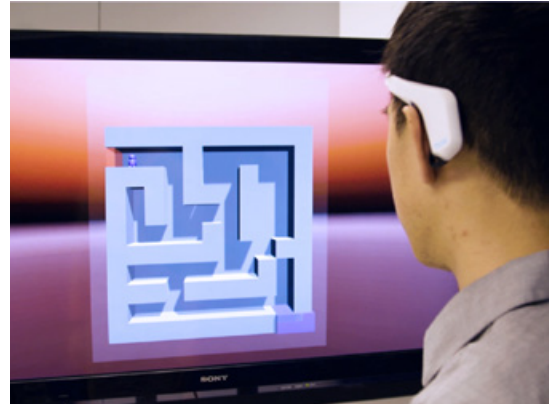
EMLx

Where EML is focused on faculty-originated projects, EMLx provides the opportunity for students to pursue their own projects. While projects may proceed without supervision, students can make official teams and request additional resources and get support as available from EML staff or faculty. Students can experiment freely with technology, take risks, fail, and most importantly, learn from this experience.

Before the COVID-19 closure, EMLx members would typically gather in person on Tuesdays for an hour and a half at the K. Karasin Collaboration Space for snacks, discussion, and a chance to work on their projects. Currently these sessions are hosted via Zoom.

Members of EMLx are encouraged to work on ideas that contribute to social good and betterment of society.

EMLx also serves as an excellent opportunity for prospective EML members to experiment with emerging tech, and has often served as an entry point for students who later become volunteers or part of the EML team.



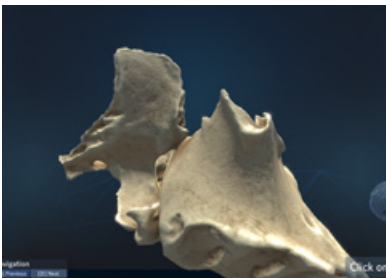
EML PROJECTS

EML projects are defined based on a set of themes and challenges.

The table below demonstrates the variety of themes that each project covers.

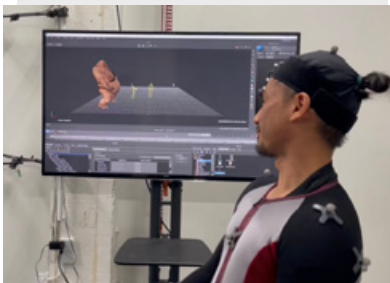
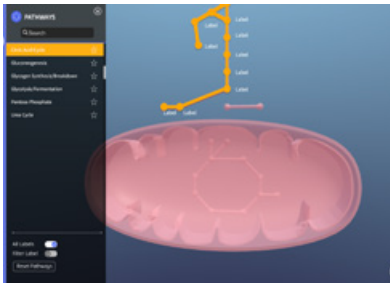
Note: All of the projects mentioned below have passed the proof of concept phase and all are considered experiential learning. For a more detailed description of each project please visit eml.ubc.ca/projects

PROJECT	MVP	THEME
Holobrain	✓	Photorealistic Object Representation, Multi-user, Multi-platform, 3D Data Visualization
Geography VR	✓	Representing Large Scale Environments, Photorealistic Object Representation, Immersive Storytelling, Interactive 360 Video
Physics World		3D Data Visualization, Gamification
Soil TopARgraphy		Representing Large Scale Environments, 3D Data Visualization, Gamification
Exploring an Ancient City		Representing Large Scale Environments, 3D Data Visualization, Gamification
Main Mall Hustle		Representing Large Scale Environments, Immersive Storytelling, Gamification
AR Building Design		Experiential Learning
Pain Box		Biosensing, Simulation Space
Math World		3D Data Visualization
Journey With Me	✓	Immersive Storytelling, Gamification
UBC Time Machine		Immersive Storytelling
Digital Glass		3D Data Visualization
Language Chatsim		Representing Large Scale Environments, Immersive Storytelling, Simulation Space, Artificial Intelligence
UBC Interactive Orchestra		Simulation Space
Medical Volumetric Video		Simulation Space
Jupyter 3D		3D Data Visualization, Simulation Space
Fossa Finder	✓	Photorealistic Object Representation, Multi-user, Multi-platform
Pacific Spirit Park Tour		Multi-user
Pronunciation Station		Biosensing



EML PROJECTS

PROJECT	MVP	THEME
Pocket Pelvis		Augmented Reality, Photorealistic Object Representation, 360 Videos Generalized Tool, Photorealistic Object Representation, Interactive 360 Video
Socratic Dialogues		Experiential Learning
Digital Dream Play		Multi-user, Multi-platform, Simulation Space
Ancient Athens		Representing Large Scale Environments, Multi-user, Multi-platform
3D Metabolism	✓	Multi-platform, 3D Data Visualization
Visualizing ECG		Experiential Learning
Scholars VR		3D Data Visualization, Machine Learning
Interactive Animation Toolkit for Unity	✓	Generalized Tool, Photorealistic Object Representation, Multi-user, Multi-platform, 3D Data Visualization, Interactive 360 Video
Virtual Co-locator		Immersive Storytelling, Multi-user, Multi-platform, Gamification, Simulation Space, Machine Learning
Stratigraphy		Data Visualization
Moot Court		Immersive Storytelling, Multi-user, Multi-platform, Gamification
Geospatial Audio		Immersive Storytelling, Multi-user, Multi-platform, Gamification, Simulation Space
OER Geomatics Textbook		Data Visualization
Radiology Diagnostic Trainer		Immersive Storytelling Gamification
AAC Simulator		Immersive Storytelling, Gamification, Data Visualization, Simulation Space
Gamifying Forestry		Multi-platform, Multi-user, Simulation Space, Data Visualization
GRoTTO		Multi-platform, Simulation Space, Course-integrated projects
COGS 300 Labs		Data Visualization, Generalized tool, Multi-platform, Machine Learning, Course-integrated projects
Theatre 399E Projects		Course-integrated projects, Virtual Reality, Augmented Reality, Multi-platform, Multi-user, Simulation Space, Data visualization



EMERGING MEDIA COMMUNITY OF PRACTICE (EMCoP.ca)

The Emerging Media Community of Practice is a community of researchers, developers, designers, and educators dedicated to harnessing and synthesizing a variety of emerging media technologies for the human good.

EMCoP strives to be nimble and collaborative, committed to building a community of research and practice focused on the development of human experiences, not possible in the physical world for a positive social-economic impact.

Goals and Objectives

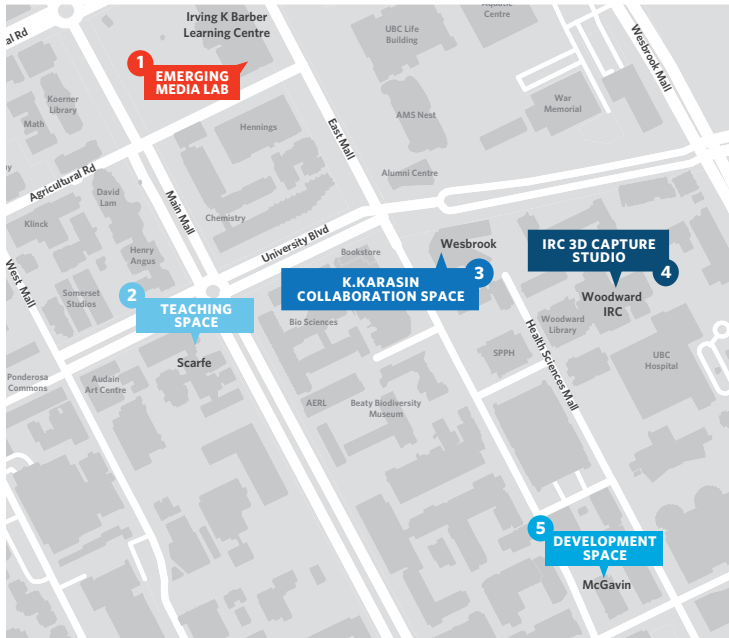
- » Build a higher education community of practice in British Columbia focused on Emerging Media technologies.
- » Surface and make visible collaborative work being done in this space to stakeholders.
- » Act as a match-maker connecting industry with educators and researchers that are developing Emerging Media solutions.



Current Collaborators

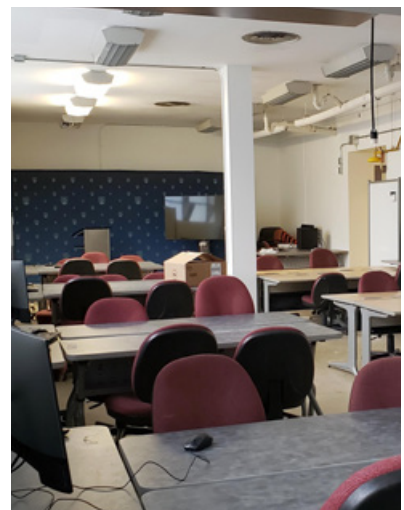
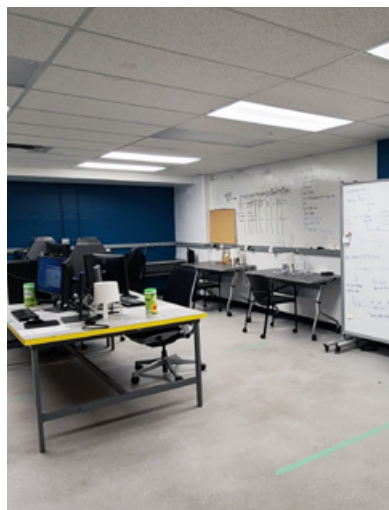
- » University of British Columbia
- » Simon Fraser University
- » Emily Carr University of Art and Design
- » British Columbia Institute of Technology
- » University of Victoria
- » The Centre for Digital Media
- » Kwantlen Polytechnic University
- » Vancouver Coastal Health
- » University of Ottawa
- » University of Michigan

EML SPACES



EML has five locations:

- 1 The Emerging Media Lab
at Ike Barber Learning Centre
Irving K. Barber Room 183, 1961 East Mall
Vancouver, BC Canada V6T 1Z1
Tel: 604-822-2669
- 2 The Scarfe Lab Teaching Space
- 3 The K.Karasin Collaboration Space
at Wesbrook, with over 15 workstations
- 4 The IRC 3D Capture Studio
- 5 The McGavin Development Space





THE UNIVERSITY OF BRITISH COLUMBIA

Emerging Media Lab

eml.ubc.ca