



Athabasca  
University

## カナダのオープン大学・アサバスカ大学建築学部における オンライン教育とバーチャルデザインスタジオ

Online Education & Virtual Design Studios at the Centre for Architecture at Athabasca  
University - Canada's Open University

ヘンリー・ツァン アサバスカ大学建築学部 助教授

Dr. Henry Tsang Assistant Professor, Athabasca University, RAIC Centre for Architecture

# プロフィール



1977年  
1997-2000年  
2000-2002年  
2002-2006年  
2006-2012年  
2013-2015年  
2014年  
2015-2019年  
2019年-現在

カナダ・ケベック州モントリオール市生まれ  
カナダ・マギル大学 建築学科 卒業  
カナダ・マギル大学大学院 建築学専攻 修士課程 終了  
東京大学大学院工学部研究科 建築学専攻 博士課程 終了  
(株)日本設計 国際建築設計群 勤務  
カナダ・ハージングカレッジ 建築学部 講師  
カナダ・ヘンリーツァンアーキテクト 建築設計事務所 設立  
韓国・啓明大学 工学部建築学科 助教授  
カナダ・アサバスカ大学 建築部 助教授

## Dr. Henry Tsang

ヘンリー・ツァン 工学博士  
アサバスカ大学 建築学部  
助教授・建築士

# カナダのオープン大学・アサバスカ大学

## Athabasca University

- 大学創立: 1970
- アルバータ州にある州立の公開大学
- カナダを代表する遠隔教育およびオンライン大学
- キャンパス: アサバスカ、エドモントン、カルガリー
- 学生数: 40722
- 世界87カ国の留学生が自国にて勉強
- 1994年、世界初のe-MBA



Each AU graduate has a story  
to tell. What's yours?

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#yourAUstory



# RAIC建築センター(建築学部)について

- 1907年、カナダ王立建築協会(Royal Architectural Institute of Canada: RAIC)が設立されました。
- 1978年から、RAICはカナダで通信教育および見習い実習プログラムを始めました。
- 2011年、従来の通信教育および見習い実習プログラムの授業をオンラインで提供するために、アサバスカ大学内にRAIC建築センター(建築学部)を設立し、現在、カナダ初のオンライン建築プログラムとして運営しています。

# クラウドコンピューティング

2020年、アサバスカ大学はITインフラをAmazon Web Service (AWS)のクラウドに移行しました。



Jennifer Schaeffer (アサバスカ大学IT部副部長)

# 建築のプログラム

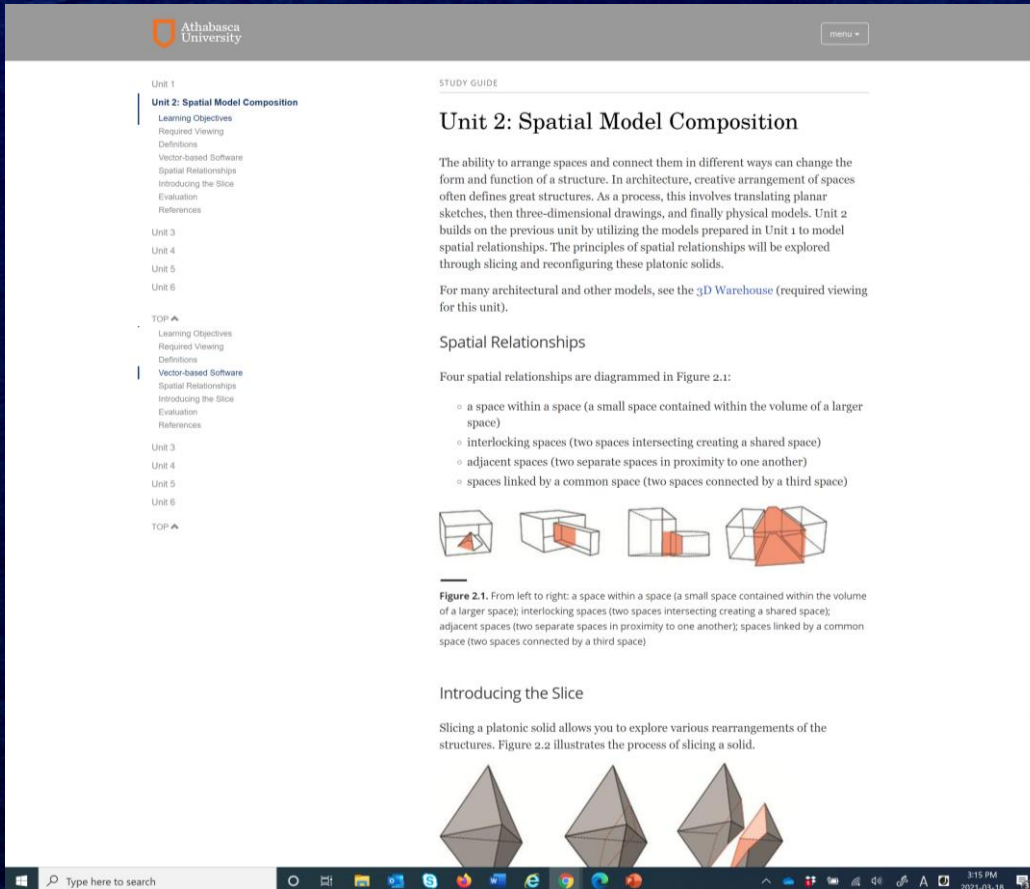
DESIGN	PROFESSIONAL	COMMUNICATION	THEORY	HISTORY	TECHNICAL							
ADST 200 (3) and ADST 205 (3) or RAIC 200 - Foundations of Design I (6)	MATH 209 - Finite Math (3)	COMP 210 - Introduction to Information Systems and Computer Applications (3)	PHIL 252 - Critical Thinking (3)	ENGL 255 - Introductory Composition (3)	PHYS 200 - Introductory Physics (3)							
ADST 300 - Foundations of Architectural Design: Elements OR RAIC 300 - Foundations of Architectural Design: Elements (6)	MATH 215 - Introduction to Statistics (3) OR MATH 216 - Computer-oriented approach to Statistics (3)	APST 215 - Introduction to Graphic Representation (3)	PHIL 333 - Professional Ethics (3) OR PHIL 371 - Ethics: Science, Technology & the Built Environment (3)	ARCH 200 - History of Ideas in Architecture I (3)	PHYS 201 - Introduction to Physics (3) OR PHYS 202 - Introduction to Physics II (3)							
ADST 350 - Foundations of Architectural Design: Simple Habitat OR RAIC 350 - Foundations of Architectural Design: Simple Habitat. (6)	PSYC 432 - Psychology and the built environment - Serves as elective major (3)	APST 220 - 3D Modeling, Digital Representation & Presentation (3)	ARCH 330 - Architectural Design Theory Fundamentals (3)	ARCH 300 - History of Ideas in Architecture II (3)	APST 230 - Materials, Properties, Applications (3)							
ADST 400 - Foundations of Architectural Design: Collective Habitat OR RAIC 400 - Foundations of Architectural Design: Collective Habitat (6)	1 Business 3XX or 4XX - In Organizational Behavior and/or Marketing; Serves as elective (3)	APST 255 - Computer Aided Design (3)	ARCH 340 - History and Theory of Modernism (3)	ARCH 320 - History of Canadian Architecture (3)	APST 240 - Introduction to Structures (3)							
ADST 450 - Architectural Design: Cultural, Recreational and Institutional OR RAIC 450 - Architectural Design: Cultural, Recreational and Institutional (6)	1 Science 3XX or 4XX - Serves as elective (3)		ARCH 420 - Contemporary Architectural Theory and Research (3)		APST 340 - Advanced Structures (3)							
ADST 490 - Architectural Design: Workplace OR RAIC 490 - Architectural Design: Workplace (6)			ARCH 350 - Landscape (3)		APST 350 - Architectural and Applied Sciences (3)							
			ARCH 400 - Urbanism (3)		APST 470 - Building Envelope and Assemblies (3)							
					APST 480 - Mechanical Equipment of Buildings (3)	Total Credits Arch						
Credits	36	Credits	15	Credits	12	Credits	21	Credits	12	Credits	24	120

## 授業のカテゴリー

1. デザイン
2. プロフェッショナル
3. コミュニケーション
4. セオリー・理論
5. 歴史
6. テクニカル

# オンライン講義と LMS学習管理システムシステム

LMSはMoodleからBrightspaceへ移行。  
講義はMicrosoft TeamsとZOOMを利用。



The screenshot shows the Athabasca University LMS interface. The main content area displays the 'STUDY GUIDE' for 'Unit 2: Spatial Model Composition'. The text explains that the ability to arrange spaces and connect them can change the form and function of a structure. It describes the process of translating planar sketches into three-dimensional models. The guide lists four spatial relationships: a space within a space, interlocking spaces, adjacent spaces, and spaces linked by a common space. Below the text are four diagrams illustrating these relationships. The bottom of the page shows 'Introducing the Slice' with three diagrams of a tetrahedron being sliced.

**Unit 2: Spatial Model Composition**


The ability to arrange spaces and connect them in different ways can change the form and function of a structure. In architecture, creative arrangement of spaces often defines great structures. As a process, this involves translating planar sketches, then three-dimensional drawings, and finally physical models. Unit 2 builds on the previous unit by utilizing the models prepared in Unit 1 to model spatial relationships. The principles of spatial relationships will be explored through slicing and reconfiguring these platonic solids.

For many architectural and other models, see the [3D Warehouse](#) (required viewing for this unit).

### Spatial Relationships

Four spatial relationships are diagrammed in Figure 2.1:


- a space within a space (a small space contained within the volume of a larger space)
- interlocking spaces (two spaces intersecting creating a shared space)
- adjacent spaces (two separate spaces in proximity to one another)
- spaces linked by a common space (two spaces connected by a third space)



**Figure 2.1.** From left to right: a space within a space (a small space contained within the volume of a larger space); interlocking spaces (two spaces intersecting creating a shared space); adjacent spaces (two separate spaces in proximity to one another); spaces linked by a common space (two spaces connected by a third space)

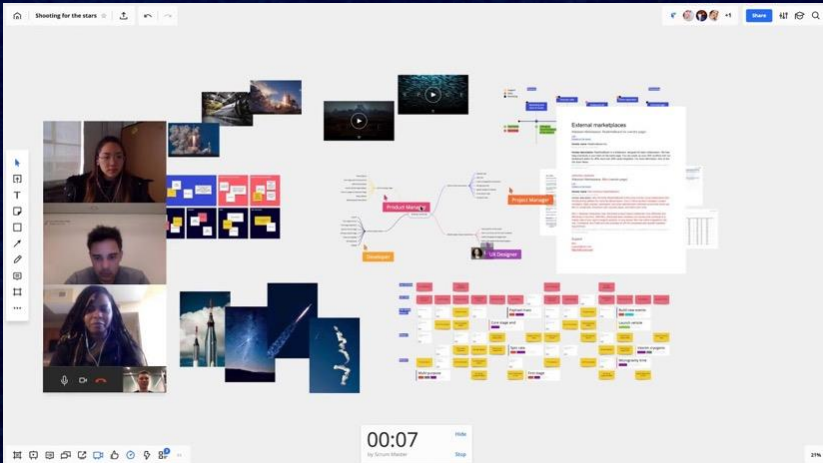
### Introducing the Slice

Slicing a platonic solid allows you to explore various rearrangements of the structures. Figure 2.2 illustrates the process of slicing a solid.



# バーチャルデザインスタジオ

## Critique markups / screenshots

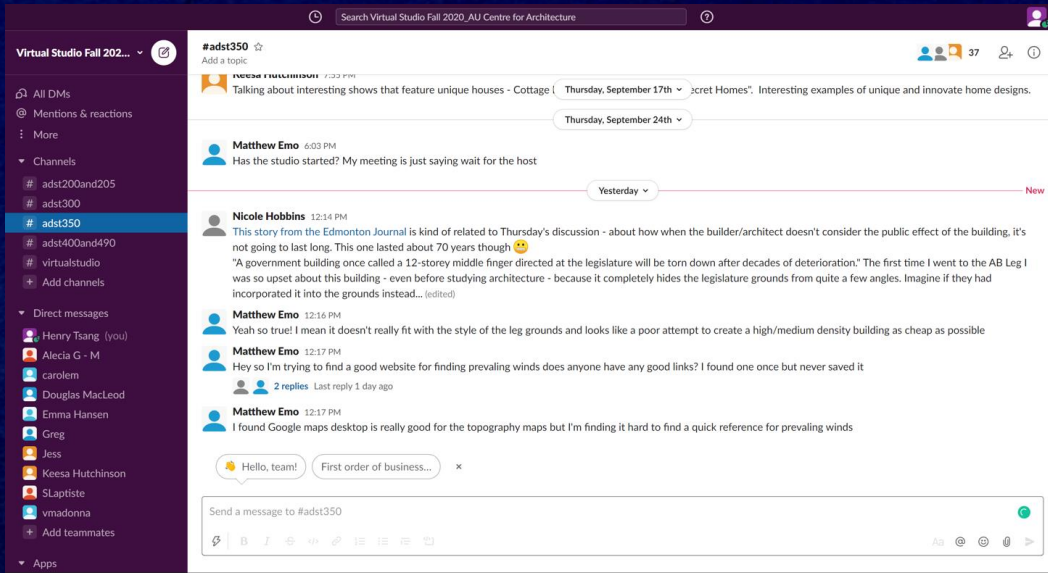


ZOOM (Credit: Vedanta Balbahadur – McGill University)

Collaborative Mind Mapping (Credit: Miro Mind Map)

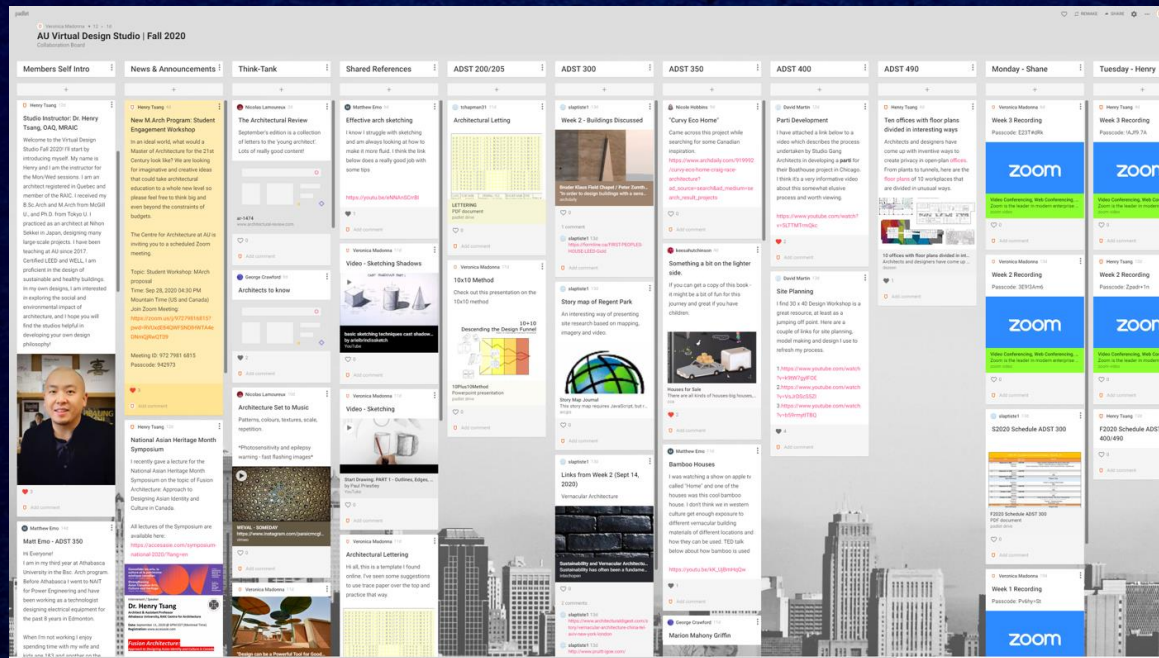


# Social Media: Slack & Padlet



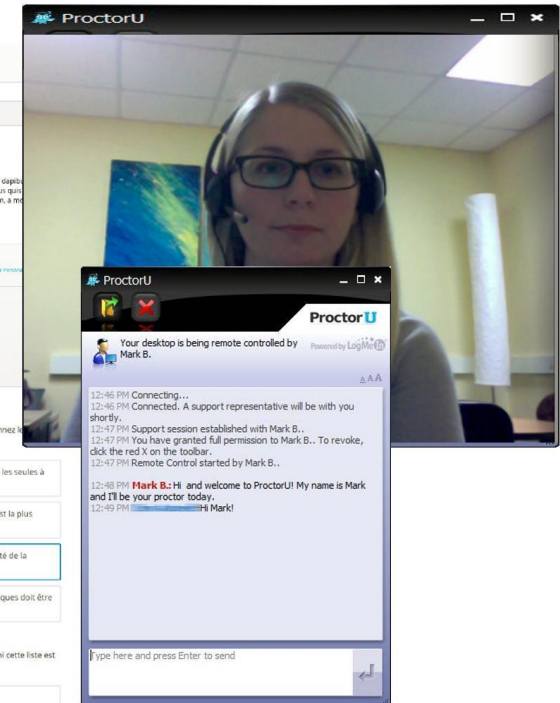
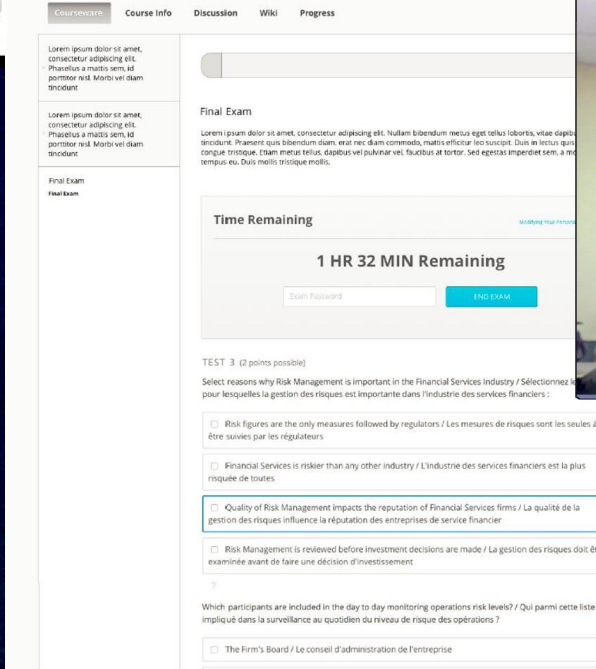
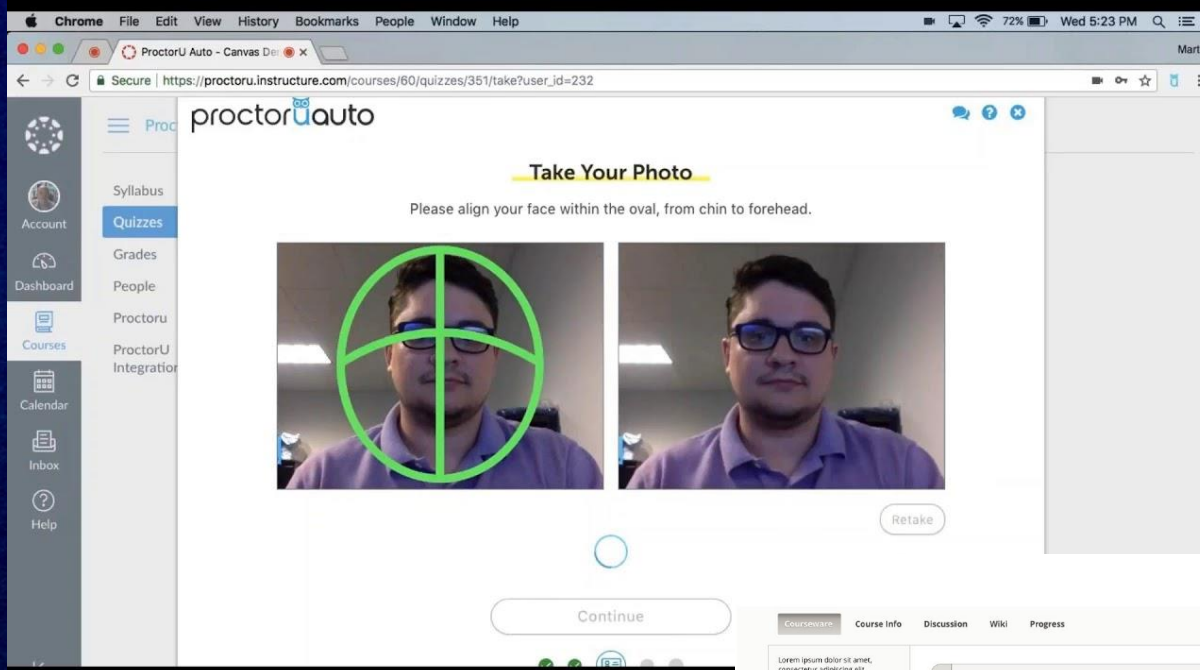
Credit: AU RAIC Centre for Architecture – Slack App

Credit: AU RAIC Centre for Architecture – Padlet App



# 試験のインビジレーション

## Proctor Uシステム



# STEM授業と試験

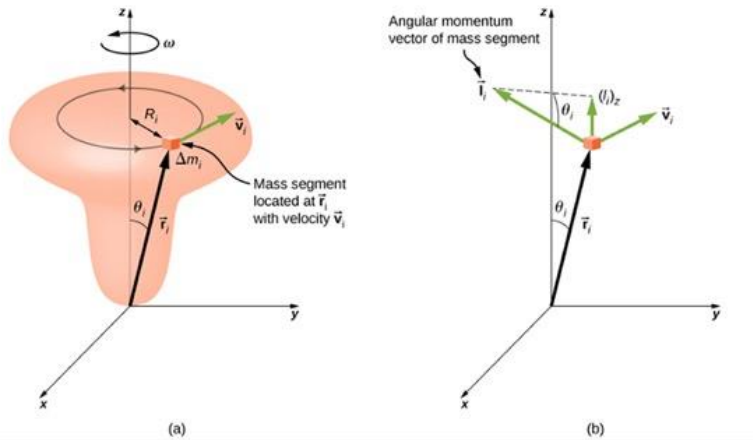
## MapleとMobiusシステム

### Angular Momentum of a Rigid Body

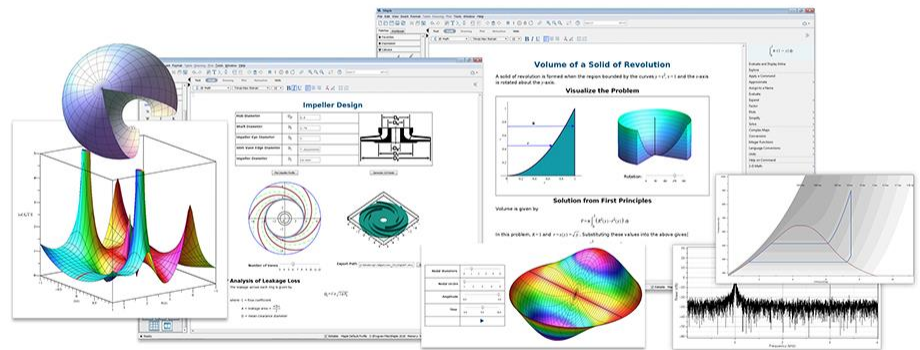
We have investigated the angular momentum of a single particle, which we generalized to a system of particles. Now we can use the principles discussed in the previous section to develop the concept of the angular momentum of a rigid body. Celestial objects such as planets have angular momentum due to their spin and orbits around stars. In engineering, anything that rotates about an axis carries angular momentum, such as flywheels, propellers, and rotating parts in engines. Knowledge of the angular momenta of these objects is crucial to the design of the system in which they are a part.

To develop the angular momentum of a rigid body, we model a rigid body as being made up of small mass segments,  $\Delta m_i$ . In **Figure 11.12**, a rigid body is constrained to rotate about the  $z$ -axis with angular velocity  $\omega$ . All mass segments that make up the rigid body undergo circular motion about the  $z$ -axis with the same angular velocity. Part (a) of the figure shows mass segment  $\Delta m_i$  with position vector  $\vec{r}_i$  from the origin and radius  $R_i$  to the  $z$ -axis. The magnitude of its tangential velocity is  $v_i = R_i\omega$ . Because the vectors  $\vec{v}_i$  and  $\vec{r}_i$  are perpendicular to each other, the magnitude of the angular momentum of this mass segment is

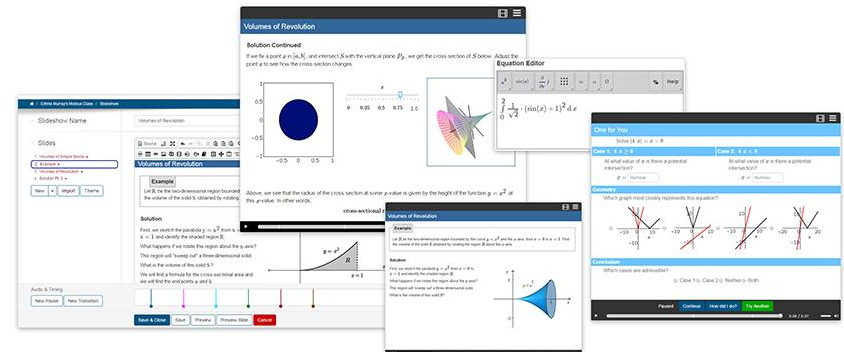
$$l_i = r_i(\Delta m_i v_i) \sin 90^\circ.$$



**Mobius Content Packs**  
([https://digitaled.com/content/physics\\_mechanics\\_waves\\_acoustics#](https://digitaled.com/content/physics_mechanics_waves_acoustics#))



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Global Studio Lecture Series

Hosted by Athabasca University RAIC Centre for Architecture, Advocates for Equitable Design Education, Indigenous Design Collaborative

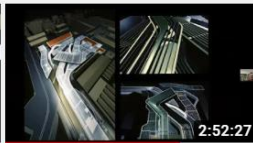
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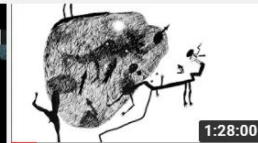
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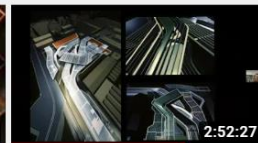
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# 図書館郵送サービス

## オンライン予約と国内無料配送



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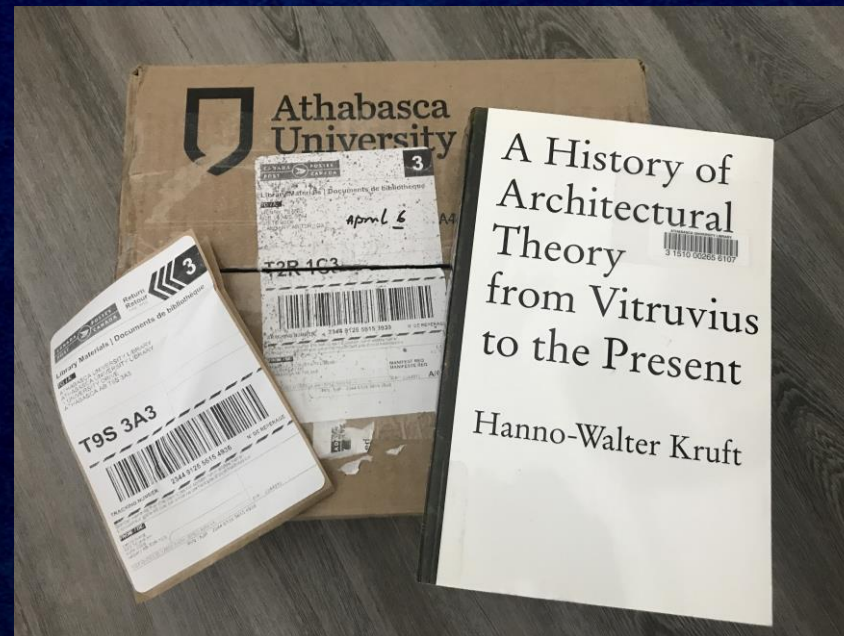
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Open Access Publishing Webinar  
Thurs., Mar. 18, 1-2 pm MT  
More info

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# コロナによるオンライン大学への影響

- コロナ以前、生徒達が試験を受ける際、テストセンターで試験を受けていました。コロナ禍でテストセンターの使用が出来なくなり、オンライン試験や、PBL課題およびレポートの提出に変更されました。ただ、実験室だけは、制限付きでオープンされています。
- 一般事務の従業員は、キャンパスへ出勤していたが、コロナ禍で、テレワークに変更されました。(教員は、コロナ以前からテレワーク)
- 学生数が増加し、それに伴い教員も増加。
- 教材をオンライン化(PDFなど)

# バーチャルCo-opと実務経験



Virtual Work Experiences (Credit: JMIR Publications Advancing Digital Health)

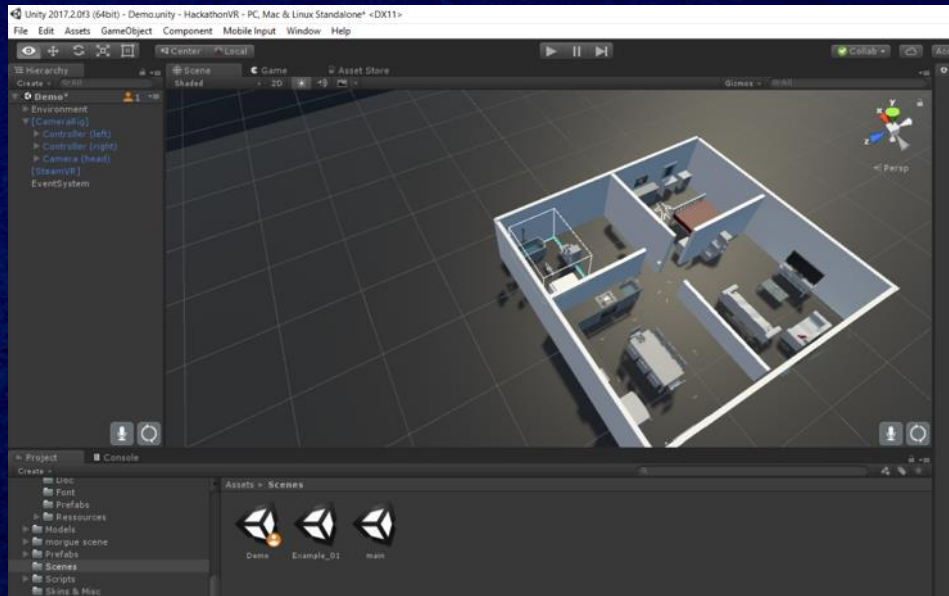


Gaming Engines Used for Virtual Work Simulators  
(Credit: NowGaming Appadvice)



Future Skills Network - Virtual Coop (Bob Heller, Freud Chatbot)

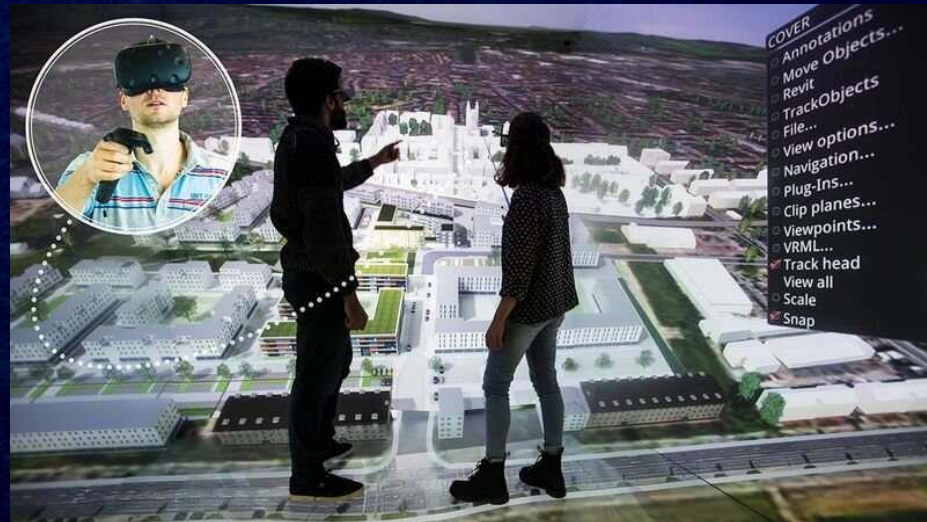
# AR (拡張現実) と VR (仮想現実)



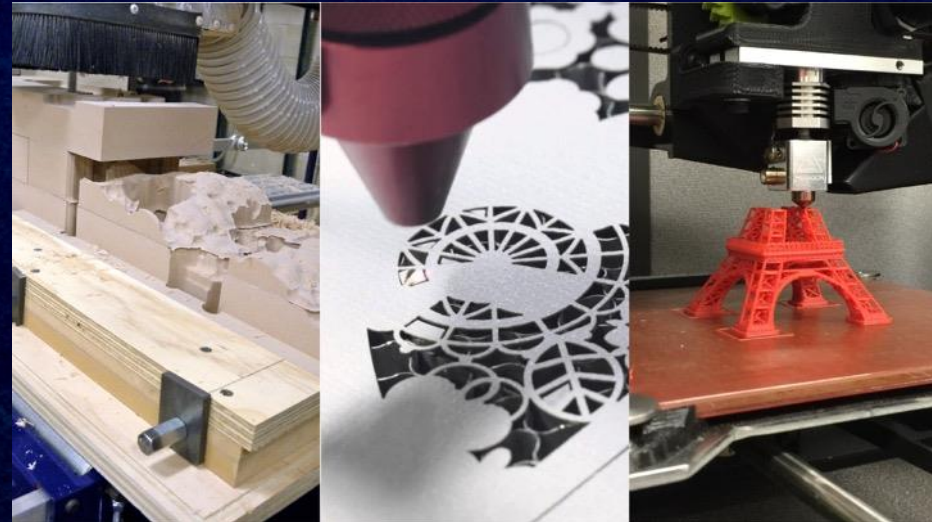
Unity VR (<https://connect.unity.com/p/vr-detective-game>)



Immersive Learning Environments - Visionarium



Augmented Reality & Virtual Reality (Credit: KoLab)

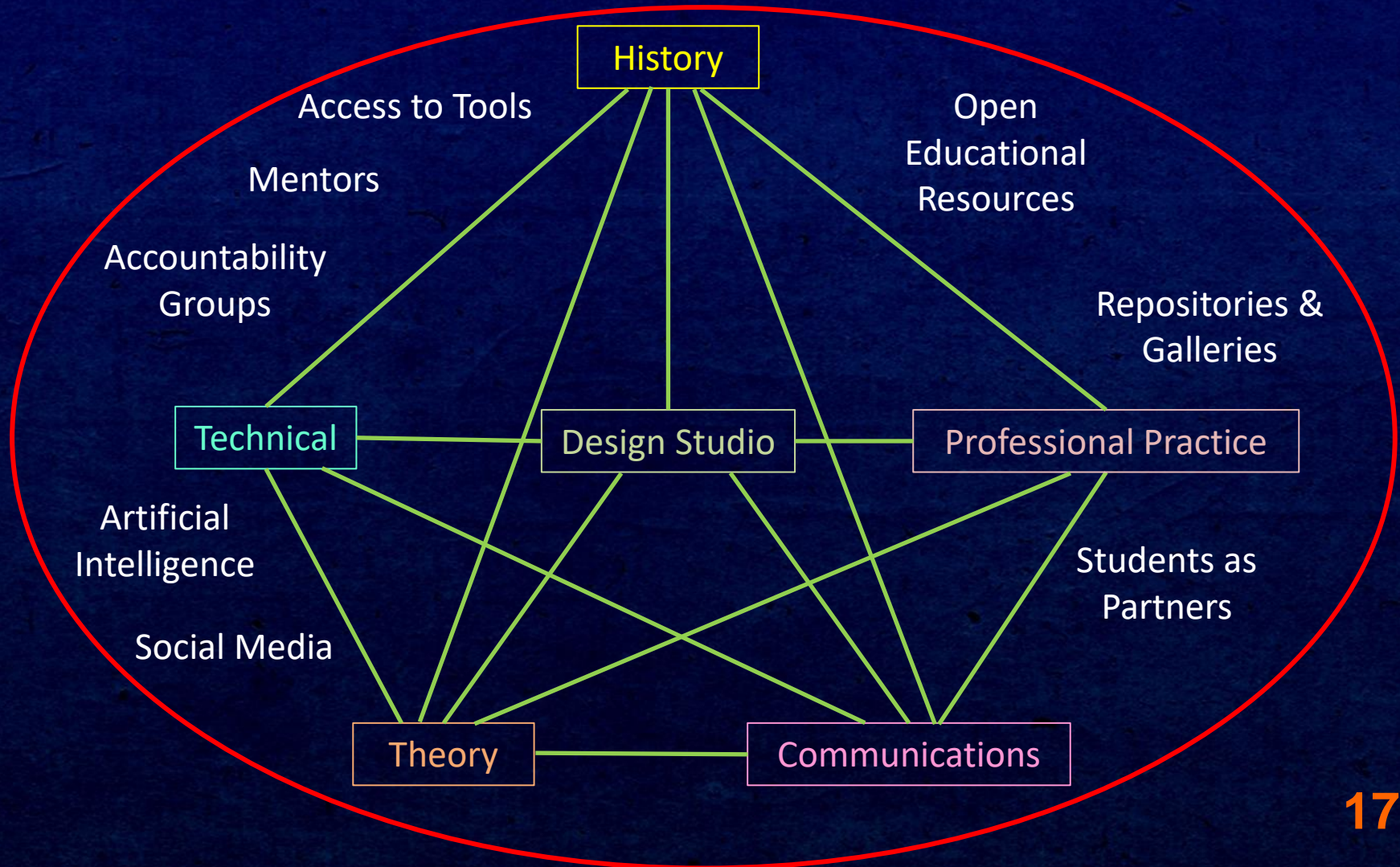


Mail Order Digital Fabrication / 3D Printing (Credit: University of Texas)



# まとめ

## 建築プログラムのIntegrated Learning Environment





ご清聴ありがとうございました  
Thank you

**Dr. Henry Tsang**

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アサバスカ大学 建築学部 助教授・建築士

[htsang@athabascau.ca](mailto:htsang@athabascau.ca)