

MIT 4.562/502 Fall 2022 Architecture in Motion Graphics (Advanced Visualization)

Cinematic, Interactive and Narrative of Spatial Experience

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Staff

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Meeting times

Mondays 12:30-3:00pm: Lectures and reviews (Off-line meeting)

Mondays 7:00-8:30: Demos and hands-on lab (Off-line meeting)

* 4.562 is for Grad students. 4.502 is for Undergrad students. The classes meet together.

~~* One required half-day weekend session (live video recording practice) and another optional weekend session (VR lab introduction) are planned during the semester.~~

* One online class is expected during November due to his conference trip. Date is TBA.

Grades

Grades will be based on assignments, participation in class discussions and the final project.

4 assignments (ex1-ex4: see below) 55% (= 5% + 20% + 15% + 15%)

Reading/Discussion/Participation 10%

Final project (presentation required) 35%

Final Presentation

Two dates are allocated for the final presentation: the last class (December 12) and the exam day of this class set by the institute. By default, undergrad students are asked to present the final project during the last class, and grad students are asked on the day of the exam. If you like to present on the other date, please let the TA know. Participation to the final presentation is required to complete the class. A team project is allowed upon permission of the instructor.

Assignments and Final Project (subject to change)

Each week, one short lecture by the instructor is followed by one lab session that students are required to attend. The lecture time is also used for reviewing student projects. Additionally, there is a set of five reading materials distributed over the semester, and a discussion session on each set takes place during the lecture when each reading assignment is due. A student is expected to attend all lectures, spend time outside the class to complete assignments and the final project, and engage in the discussion sessions and reviews.

- ex1: Digital Storyboard (Video editing: 1 week, small team) 5%
- ex2: Light, Material, Camera and Spatial Experience (Animation: 3+1 weeks, individual) 20%
- ex3: Collaging Reality, Reconfiguring Experience (3D Capturing: 2 week, small team) 15%
- ex4: Event and Spatial Experience (Game Engine or Video Editing: 2 weeks, mid-size team) 15%
- Final Project: There will be an initial pinup, a mid-point check, and a final review (4 weeks)

* Students deliver their assignments and final projects as video clip/interactive content presentation. All **the digital contents produced by students in this class (video and interactive contents) will be publicly reviewed** in the class, and submitted for class archive with selected projects given online access for future students and public education as reference. **Please attach the full credit of any included contents within the digital material at the time of assignment submission.**

* Graduate Students are asked to make additional small presentations on reading assignments.

Reference (Film Technicality)

The Five C's of Cinematography by J Mascelli.

Michael Rabiger: Directing - Film Techniques and Aesthetics -

Richard Stromgre+Martin Norden : Movies -a language in light

Daniel Arijon : Grammar of the Film Language

Reference (Theory and Critique)

Andre Bazin: What is Cinema?

Eisenstein: Film Form, Film Sense

Rudolf Arnheim: Film as Art

Christian Metz: Film Language : A Semiotics of the Cinema

Tarkovsky: Sculpting in Time

The Architecture of Image - existential space in cinema -

Anthony Vidler: The Explosion of Space (Film Architecture From Metropolis to Blade Runner)

Software instruction (You may use any alternative tools you like.)

Main tools: 3DS Max, Adobe Premiere, Unity 3D, Recap, MIT Design Heritage

Other recommended/alternative tools: Metashape, Blender, V-Ray, Substance 3D Painter

Cost

- All necessary software is available on the public computers in studios and PC classrooms if you are using them on campus, but with limited numbers. (2022 availability is TBA)

- To work on the assignments using your own laptop computers:

a. Autodesk software (3DS Max, Remake, etc.): Student license is free.

b. Adobe Premiere: Adobe Creative Cloud for MIT students is free.

For others, student license is available from Adobe for \$20/month

c. Unity3D: Personal/Student version is free.

- Purchase of your own headphone is recommended to avoid annoying others while you are working on your assignments.

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date:09-05 Mon		Labor Day holiday
date:09-06 Tue		Registration Day
date:09-12 Mon	Class 01	Introduction - Telling a story
	Lab	Digital NLE (Premiere/After Effects) Compositing and Editing with Audio Clips Lab Note for Premiere Tutorial * Login as 4.562. Password required.
	Excercise #1	OUT: Imagining Storyboard (Digital Pre-vis) Exercise 1 Handout Audio Clips and Demo Audio Clip Registration
	Screening	Mr. Jones, My Architect
	Reading #1	OUT: Mascelli, The five C's of cinematography camera angle (pdf)
date:09-19 Mon	Class 02	Composition and Motion Camera
	Discussion	Reading #1 [required for 4.562]
	Deadline	Excercise #1 (in-class presentation)
	Excercise #2	OUT: Opening Sequence -Architecture of Cinematic Reality - Exercise 2 Handout Chair models Herman Miller 3D furniture CGtrader chair models
	Lab	Radiosity Basics Lab Note for Max installation Lab Note for Max radiosity Lab Note for Max importing files Radiosity Diagrams MIT 3dsMax2017 selector classic design.zip
		Camera Animation (Key framing and motion path) Lab Note for Max Camera animation
		Sample File (3D models) - Set 1 (Citrohan House): 3d citrohan v13c2.dwg/max (zipped) image sample - Set 2 (MIT office): rotch_d_07b_4562_v01.dwg/max (zipped) image sample Lightscape (old tool: for reference only)
	Screening	Charade, Psycho, Ginza Walk Through
date:09-26 Mon	Class 03	Lighting the Scene
	Lab	Illumination Model, Radiosity and Raytracing Daylight Simulation, Photometric Lights in 3DS Max Radiosity Visualization IES Photometric Data, Render Farm/Cloud Rendering Photometric Lights Catalogues Sample Photometric Lights Citrohan House Lighting Transformation
		Reference Film Analysis Example, Kyoung KWon (part #1)
		Stereographic imaging (See Class 04)

		Vray Introduction (See Class 10)
	Reading #2	[This assignment is moved to later class] OUT: Rudolph Arnheim: Film as Art Questions.pdf , FaA1.pdf , FaA2.pdf
	Screening	Lumiere Brothers First Film, Ruttmann's Berlin
date:10-03 Mon	Class 04 Discussion	Materiality and Tectonics Reading #2 [moved to later class]
	Lab	Texture UV Mapping, Procedural Mapping Lab Note for Max material and texture Lab Note for Max general tips Lab Note for Max rendering checklist Texture Coordinates Illustrations 3d citrohan model with no glass for texturing MAX Sample Textures (new) VIZ4 Sample Textures (old: do not use) Adobe Substance 3D Painter (NEW) part1 2 3 4 5
		Background, Sky, and Environment Map Lab Note for Max sky and ground Examples for Max sky and ground Sample Map for Sky and Ground
		Editing/Post-process Animation Lab Note for Importing/Post-process in Premiere HDR Image Example and OpenHDR Viewer Image Gamma Correction Illustrations (old)
		Stereographic imaging Lab Note for Max stereoscopy TN Office stereoscopic animation on YouTube (Chrome or FireFox needed to see anaglyphic 3D) Citrohan House Anaglyphic images and animation 3DS Camera Rig by TN 02.max (zipped) Stereoscopic Player from 3dtv.at
		Vray Introduction (See Class 10)
date:10-08 Sat	optional	VR Lab tour
date:10-10 Mon		Indigenous Peoples Day holiday Monday classes shift to Tuesday this week.
date:10-16 Mon	Class 05 Deadline	Photogrammetric Model, Interactive Viewing Excercise #2 (in-class presentation)
	Excercise #3	OUT: Online Gallery -Collaging Dislocated Reality, Reconfiguring Experience- Exercise 3 Handout
	Reference	Baker House AR (2021) (YouTube) MIT Machu Picchu Project (YouTube) Capturing History Bit by Bit
	Lab	Photogrammetric capturing Example Digital Heritage Workshop 2013 (i palladio) Photogrammetric software (free/trial versions) Autodesk Recap , Metashape , RealityCapture Tutorials 1 ReCap Photo Tutorial Video: Taking Photos

[Lab note for Metashape](#)
[Sample photos \(MFA Sculpture\)](#)

Tutorials 2

[Baking to Texture in 3DS Max](#)

3D Collaboration Platform

[Design Heritage](#)

[Exhibition Booths](#) (template model)

Reading #3

[moved to class 9] OUT: Eisenstein

date:10-24 Mon

Class 06
Discussion

Shot Planning, Location Shot, Video Composite
Reading #3 [moved to class 9]

Lab

Video Composite
Premiere/Unity: Chroma key
[Lab Note for Premiere Chroma Key](#)
[Example \(Firminy Long Lounge\)](#)
[Blue Screen \(Chroma Key\) demo](#)
[Blue background session rig files \(zipped\)](#)
Camera Motion Capture/Tracking
Blender Tracking tutorial (See Dropbox location)
SynthEyes (optional for self-learning)
[Example \(Firminy Pepsi Can\)](#)
[Blender home page \(free\)](#)
[Blender Tutorial \(pointers to videos\)](#)
~~[SynthEyes home page](#)~~
~~[SynthEyes \(Video\) Tutorials](#)~~
~~[SynthEyes Manual for v2013](#)~~
~~[\(Old Manual for v2008+1\)](#)~~
3DS Max Channel rendering, Video post, G-channel
(Render by Elements and Video Composite)
[example](#)

Reference

[Mies van der Rohe's drawings \(zipped jpg\)](#)
[Shot examples in pre-vis. format](#)

Marker-based

Motion Tracking example
[GE Plugin Smartgird.com](#)
[AR Media 3DS Plug-in](#)

Screening

Video: [Setting up a Blue Screen Studio at MIT](#)

date:10-31 Mon

Class 07

Interactive Experience vs Linear Montage

Lab

Game Engine software
Setting up a Scene in Unity 3D
[Download Free Personal Edition of Unity 3D](#)

Deadline

Excercise #3 (in-class presentation)

Excercise #4

OUT: Virtual Tour of Location X
[Exercise 4 Handout](#)

[Examples \(desktop VR and AR\)](#)

[Mies van der Rohe's drawings \(zipped jpg\)](#)

Reference

Automated Cinematographer
[A Synthetic Moviemaker \(Siggraph 2006 paper\)](#)
[Man with the Movie Camera](#) (YouTube link)

Screening

The Umbrellas of Cherbourg

~~date:11-05 Sat~~

~~extra lab~~

~~Bluescreen studio live recording session
(Subject to the COVID-19 pandemic situation)~~

date:11-07 Mon

Class 08

Figures and Props

	Lab	<p>Animating Figures in Spatial Design Populate video tutorial (Autodesk tips/tricks) 1 , 2 , 3 , 4 , 5 , 6 Lab Note for 3DS Max Populate/Unity 3D Export Biped Character Animation (Character Studio) Lab Note for 3DS Max Character Animation Sample set (Skinned Figures/BIP Motion/Blue Screen Set: Download and unzip the Max file and texture file to a directory together before use.) Modeling by Gesture Tracking a walk by Kinect Circulating a figure in architectural model example</p>
	Screening	<p>Space Re-Actor by Taro Narahara</p>
date:11-14 Mon	Class 09	<p>Precedents: Final project for 4.502/4.562 Physics Simulation</p>
	Deadline	<p>Excercise #4 (in-class presentation)</p>
	Excercise #F	<p>OUT: Final project Final Project Handout Spatial Experience in Motion Graphics</p>
	Reading #3	<p>OUT: Eisenstein: Film Form/Sense Questions.pdf arch.pdf, form.pdf, sense.pdf Acropolis 360 on Plan YouTube video by TN (Use Chrome for 360 view)</p>
	Screening	<p>Final projects of previous students Kuleshov Experiment, Psycho, Battleship Potemkin Psycho, Hitchcock 1964 Interview on Montage</p>
	Lab	<p>Motion Dynamics/Inverse Kinematics in MassFX demo file (MassFX basics): after Max 2012 demo file (Reactor, part 1): before Max 2011 (old) Lab Note for Max MassFX Lab Note for Max ART rendering Lab Note for Max iray rendering (old)</p> <p>Examples example (dropping objects) example (swinging door) example (curtain)</p> <p>More procedural material Simple Water in 3DS Max</p>
	Screening	<p>SONY Bravia CF/transformating daily life (at MIT)</p>
date:11-21 Mon	Class 10	<p>Predictive Visualization: Unbuilt Monuments</p>
	Discussion	<p>Reading #3 [required for 4.562]</p>
	Reference	<p>Automated Cinematographer A Synthetic Movie-maker (Siggraph 2006 paper) Man with the Movie Camera (YouTube link)</p>
	Deadline	<p>Storyboard and Set for Final Project (with review)</p>
	Lab	<p>VRay (Global Illumination Rendering with Caching) Lab Note for 3DS Max Vray (Check yellow part.) Rendering Animation with Vray</p>
	Reading #4	<p>OUT: Andre Bazin: What is Cinema? Questions.pdf bazin.pdf Special Effect use in Citizen Kane (YouTube)</p>

YouTube Clips (Flaherty/Lamorisse/Chaplin, etc)

	Reading #5	Christian Metz: Film Language
	Screening	Unbuilt Monuments
date:11-24 Thu	No class	Thanksgiving Week (Th 24, Fr 25)
date:11-28 Mon	Class 11	Augmented and Virtual Reality
	Discussion	Reading #4 [required for 4.562]
		Reading #5 [required for 4.562]
	Lab	Palladio Burns and 360 (Chrome recommended.)
		Double Tour: S. Giorgio Maggiore Refectory
		QuickTime VR by Apple (History)
		Interior Panorama with IES Light (Citrohan House)
		QTVR Panorama conversion tool
		demo file: 3d citrohan v13c panorama.max (zipped)
		Workshop (Consultation for Final Projects)
		Reference 4: Augmented Reality in Architectural Exhibitions (Nagakura, et. al.)
date:11-05 Mon	Class 12	TBA
date:12-12 Mon	Class 13	Final Presentations (Recommended for UG Students)
	Lab	Clothes, Hair, Snow, etc.
		Workshop (Consultation for Final Projects)
date:12-14 Wed		Last day of class at MIT
date:12-16/22	MIT Final exam week:	Final Presentations