

Independent Study Proposal: **Image and Audio Generation and Editing using Python and C# Programs, and Editing Software**

Independent Study Term: SP - 21

Study Director: Colin Capers

Independent Study Description:

In this course, I will work under Colin Capers' direction, conducting audio and visual (static and video) production and post-processing experiments on a quest to explore digital art creation using programming and editing software. I will spend the term building, servicing, perfecting, and assembling a selection, or portfolio of sorts, of techniques to produce and modify sounds and (frequently, moving) images. The final portfolio will describe at least ten different techniques for data recording, generation, and manipulation which produce notable effects and will show examples of the result as well as summary explanations of the processes in use. I will dedicate my research time in this project studying audio and video recording, as well as editing and post-processing techniques using code libraries in Python and C# as well as software suites such as Adobe Premiere, After Effects, Media Encoder, and Audition, which also allow for additional scripting. For each of these, I will use the help documentation and guides provided by the software providers as reference. The work product of this independent study will be the portfolio of techniques, descriptions, explanations, and examples, which will be submitted as a GitHub repository, and a short video presentation.

Relationship to my COA studies:

In my first two years at COA I have demonstrated a keen interest both in the visual arts, and in programming. I spend a lot of my free time working with cameras, optics, and watercolours, and playing with recursion and loops in footage and the recording and playback processes of sound and video. At COA, I have taken two photography courses with Joshua Winer, and two film and video art courses with Colin Capers. In the 2020 winter term I took the initiative to open a programming club for students on campus. In the spring

term of 2020, I co-led an independent study with Pietro Cascia in which I designed and built an infrared stereo camera using microcontrollers and Python. I also took a course on AI, future studies and the philosophy of technology in the fall of 2021, and Biology through the lens in the winter of the same year. Throughout my time at COA, I have consistently selected courses that would allow me to pursue my interests in visual and audio-visual art, as well as in software-assisted artistic creation. This independent study is in direct continuation of my studies at COA as it allows me to explore my interests in audiovisual production and programming. It will allow me to gain experience that will be useful in other courses during my COA education such as Data science courses, photography and videography courses such as "Alternative Processes in Photography" or "Documentary video studio", and art courses. This independent study may lay groundwork for a future senior project.

Learning Goals:

1. Be able to demonstrate proper management of an exploration and experimentation project, and successfully report results and discoveries of processes of interest and their inner workings. The proper management section of this learning goal includes project organisation and data management, software skills, time and resource management, and the assembly of the final portfolio.
2. Learn to effectively and engagingly communicate new artistic and technical approaches to modifying digital visual and audio media.
3. Expand on my programming skills in Python and C#, and my understanding of libraries used over the course of this project.
4. Expand on my technical understanding of audio-recording, photographic, and video processes.

Course Structure:

Although I anticipate that I will spend most of my time working on the project organisation and research of new editing processes, a significant portion of my time will be dedicated learning to use the software and code libraries described in the project description section of this proposal, and another will be spent getting new editing techniques to work and producing process result examples and documentation. I will also constitute a reading and watching list from which I will tick off one element (related to video art, music, sound, or alternative digital editing processes) weekly. Finally, I will also spend

time in weekly meetings with Colin coordinating my work and checking in on project progress and adjustment needs.

Academically Engaged Hours:

Readings and watching from self-assigned material list: 3 hours weekly (30 total) Project organisation and research of new editing processes, learning to use the software and code libraries: 9 hours weekly until week 6 (54 total) getting new editing techniques to work and producing process result examples and documentation: 9 hours weekly from week six to week ten (36 total). Project scheduling and timeline planning and adjusting: 3 hours weekly (30 total) Meeting with Colin: 1 hour weekly (10 total) Total Hours: 160

Evaluations:

- Completion of weekly watching and reading goals and synchronicity with the project plan and timeline expressed in this proposal **50%**
- Successful execution and completion of final body of work: **50%**
- My final will be a short video presentation of a selection of ten digital media recording, editing, and generation processes, as well as a GitHub repository of examples and documentation explaining how to make use of them.

Readings and Articles (sample selection):

- Benn Jordan. *Metasynth - The Curious DAW From A Parallel Universe*, 2021. <https://www.youtube.com/watch?v=4-GDOIOAuU4>.
- <https://docs.opencv.org/2.4/doc/tutorials/tutorials.html>
- Wendy Carlos *Demonstrates Her Moog Synthesizer in 1970* - YouTube. Accessed September 17, 2021. https://www.youtube.com/watch?v=4SBDH5uhs4Q&list=FL0tYQKhuU_QR_gDSWV0UdLA&index=23&t=107s.
- Russell, Stuart, and Peter Norvig. *Artificial Intelligence: A Modern Approach*. 4th edition. Hoboken: Pearson, 2020.
- Hofstadter, Douglas R. *Gödel, Escher, Bach: An Eternal Golden Braid*. 20th Anniversary ed. edition. New York: Basic Books, 1999.
- Crutchfield, James P. "Space-Time Dynamics in Video Feedback." *Physica D: Nonlinear Phenomena* 10, no. 1 (January 1, 1984): 229–45. [https://doi.org/10.1016/0167-2789\(84\)90264-1](https://doi.org/10.1016/0167-2789(84)90264-1).
- YoDrChaos. *Space-Time Dynamics in Video Feedback*, 2013. <https://www.youtube.com/watch?v=B4Kn3djJMCE>.

- Falconer, Kenneth. *Fractals: A Very Short Introduction*. Illustrated edition. OUP Oxford, 2013.

Schedule:

16 hours of work per week evenly distributed over the term (as all classes should do)¹.

Week	Schedule	Total hours
Week 1	<ul style="list-style-type: none"> • Meeting with Colin to finalise project details (1 hour) • Introductory reading and research (3 hours) • Project introductory organisation and research of new editing processes, process idea and desired effect idea brainstorming and initial research into learning to use the software and code libraries (9 hours) • Project scheduling and timeline planning and adjusting (3 hours) 	16 hours
Week 2	<ul style="list-style-type: none"> • Project organisation and research of new editing processes, learning to use the software and code libraries (9 hours) • Art and digital media processes reading and research (3 hours) • Software development reading and research (3 hours) • Check-in meeting with Colin (1 hour) 	16 hours
Week 3	<ul style="list-style-type: none"> • Programming new media editing and generating techniques (1/2) (9 hours) • Art and digital media processes reading and research (3 hours) • Software development reading and research (3 hours) • Check-in meeting with Colin (1 hour) 	16 hours
Week 4	<ul style="list-style-type: none"> • Programming new media editing and generating techniques (1/2) (9 hours) • Art and digital media processes reading and research (3 hours) • Software development reading and research (3 hours) • Check-in meeting with Colin (1 hour) 	16 hours
Week 5	<ul style="list-style-type: none"> • Producing new process result examples and documentation (1/2) (9 hours) • Art and digital media processes reading and research (3 hours) • Software development reading and research (3 hours) • Check-in meeting with Colin (1 hour) 	16 hours
Week 6	<ul style="list-style-type: none"> • Producing new process result examples and documentation (1/2) (9 hours) • Art and digital media processes reading and research (3 hours) • Software development reading and research (3 hours) • Check-in meeting with Colin (1 hour) 	16 hours

¹ I strongly believe that spikes of work and stress during midterms and finals are unnecessary and directly impede the abilities of students to produce quality work.

Week 7	<ul style="list-style-type: none">• Programming new media editing and generating techniques which produce wacky effects (1/2) (9 hours)• Art and digital media processes reading and research (3 hours)• Software development reading and research (3 hours)• Check-in meeting with Colin (1 hour)	16 hours
Week 8	<ul style="list-style-type: none">• Programming new media editing and generating techniques which produce wacky effects (2/2) (9 hours)• Art and digital media processes reading and research (3 hours)• Software development reading and research (3 hours)• Check-in meeting with Colin (1 hour)	16 hours
Week 9	<ul style="list-style-type: none">• Record and edit first draft of final video presentation. (6 hours)• Editing and creation technique software testing (3 hours)• Finalising GitHub repository preparation along with examples and guiding explanatory process documentation (1/2) (6 hours)• Check-in meeting with Colin (1 hour)	16 hours
Week 10	<ul style="list-style-type: none">• Final polishing of software final project video presentation. (6 hours)• Finalising GitHub repository preparation along with examples and guiding explanatory process documentation. (2/2) (9 hours)• Complete and send in final project.• Final meeting with Colin (1 hour)	16 hours