

Epic MegaGrant Proposal For The Midwest Virtual Production Training Hub

Media Arts and Science Program Indiana University Purdue University ~ Indianapolis

Elevator Pitch

The [media arts and science program](#) (MAS) at Indiana University – Purdue University Indianapolis (IUPUI) is well positioned to develop and offer a curriculum in virtual production, with the goal of becoming *the* premier school in the Midwest for virtual production using Unreal Engine. Developing this capability will enable the media arts and science program to train top talent in the region for national-level virtual production positions. This will also enhance the growing technology businesses in Indianapolis and the surrounding region.

Virtual production is a field poised to transform the film industry. In coming years, there will be an increased need for talented people in all aspects of virtual production: using Unreal Engine to create digital environments, motion capture, avatar design, virtual cinematography, and LED technology. Our location in downtown Indianapolis means that training in these skills will directly benefit many currently underserved populations.

To prepare students for these opportunities, our program seeks to expand our video infrastructure so we can converge our game development, 3D design, and video production specializations. This convergence would result in the development of new courses, a certificate in virtual production, and eventually a new virtual production specialization within our major. To facilitate this development, however, we need equipment and enhancements to our current greenscreen space that would allow us to expand into this new field.

Who We Are

The MAS program, in the department of human-centered computing (HCC), in the School of Informatics and Computing (SoIC), is dedicated to teaching the digital production and conceptual skills that our students need to thrive in a variety of industries. Our vibrant curriculum includes courses in game development, 3D graphics and animation, narrative and documentary video production, visual effects, sound design, digital storytelling, and scriptwriting. The MAS faculty regularly seek ways to integrate and connect our disciplines to find synergies that can reshape and realign the program's approach to teaching and storytelling. We believe virtual production using Unreal Engine is the missing puzzle piece that would converge many of our disciplines and unlock new horizons in storytelling for our students.

Though MAS might not be a recognized leader in multimedia education, we are currently undervalued and underseen. What we lack in size or visibility, we make up for in talent, grit, and aspiration. The inspired faculty involved in this plan have worked together for over a decade and have a cumulative 63 years of dedication and service to

the school. Accomplishments include an alumni base all over the world, multiple school teaching awards and trustees' teaching awards, and the faculty has been involved as PIs (Principal Investigators) or Co-PIs on internal and external grants or contracts totaling more than \$2 million. We are serious about what we create, what we teach, and the students we serve.

Goals

Our goal is to become the premier school in Indiana and the Midwest, where students can get a comprehensive education in virtual production. We plan to offer a certificate in virtual production (5 classes) and then expand that certificate into a specialization of its own (10 classes). Within three years we could see 30 professionals seeking to reskill in the virtual production certificate, as well as another 30+ students from our existing 3D, video/sound, and game specializations. We also anticipate further student interest in the virtual production certificate on campus from the Purdue School of Computer Science, Engineering and Technology, and the Herron School of Art. Through these courses, we would not only train students to be professionals in the field but could also create and disseminate teaching material that can be used by other programs as they grow similar programs.

In addition to teaching virtual production, our faculty sees an enormous opportunity to employ the technology for research and creative endeavors. We already have an impressive history with virtual reality and video technologies employed on projects such as collaborations with Purdue School of Engineering and Technology (Office of Naval Research- Naval Imagery Infrastructure Revitalization (NIIR) Virtual Modeling Metrics) and IU (Indiana University) School of Medicine (Virtual Reality to Improve Social Perspective Taking in Youth with Disruptive Behavior Disorders, [NIH R61 Phase 1, Exploratory/Development Grant]). We love the creative possibilities of virtual production as it affords unlimited horizons in scientific and medical visualization, historical preservation, and of course narrative, non-fiction and interactive storytelling.

Plans

At MAS, compelling storytelling is central to what we do. We are passionate about storytelling in all forms and excel at teaching the techniques and technology our students need to realize their vision. As innovative technologies emerge that can reshape approaches to production, we seek to embrace and master them so our students can be at the forefront of a quickly changing industry. We are excited about how virtual production can open new storytelling possibilities and we feel that our skills as a faculty can be effectively leveraged to take advantage of the potential of this technology. Obviously, this forefront of storytelling requires a certain amount of expensive technology.

With Epic's support and our school's improved space and technology, faculty and students will be able to leverage their skills in 3D, video production, and game design to produce together both inside and outside of the classroom.

Recently the university approved our proposed certificate in virtual production. This is comprised of existing 3D and gaming courses, and the customization of an existing course on emerging video technology course (Beyond the Frame) into a virtual production course. We will start accepting the first cohort of students in the fall of 2022. All the courses in the certificate will make use of the existing technology and spaces we have on hand.

While this is a good start, being able to provide our students with a more robust educational experience will require investment. If we receive the Megagrant we will:

- Work with the university's capital projects office to make renovations to our greenscreen space that will expand the size of the cyclorama and provide better vantage points by opening the space to the hallway with the installation of accordion doors.
- Attend virtual production training sessions to prepare faculty.
- Purchase the equipment needed to light, shoot, and capture motion-tracked footage in the greenscreen studio.
- Purchase the equipment needed to leverage existing motion capture equipment to record animated avatars in Unreal environments with virtual cameras in real-time.
- Purchase post-production computers and other hardware to facilitate editing and color correction.

With the space and infrastructure modernized, we will be able to converge our students, who are currently siloed in disparate specializations, into newly combined courses in which they gain a common vernacular and mindset while working together on the virtual production set. We have already made heavy investments in full body (Faceware/Xsens/ManusVr) motion capture that will allow for virtual avatar integration of live or recorded performances.

Our school is particularly well-positioned to provide education and opportunities for underserved populations. Being a state university in the largest city in Indiana means a critical part of our mission is making the skills and technology we teach accessible to our diverse inner-city student body. In 2015, our school launched the informatics diversity-enhanced workforce (iDEW) program, an initiative to foster diversity in hi-tech. IDEW prepares students for success in technology programs by providing a full-curriculum to students in high school, teaching them user experience, programming, game development, and internet-of-things skills. Donors such as Salesforce, JP Morgan Chase, and Interactive Intelligence have all contributed financial support to this program. Recently, the program has been awarded a contract to provide training to all high schools in the state of Indiana. Learn more about the initiative at <https://soic.iupui.edu/idew/about/>.

Except for the recent grant-funded purchase of the full-body motion capture pipeline, much of our technology has become antiquated. The current pandemic has impacted

the ability of our school to maintain the capital investments needed to keep our technology up to date. In addition to budget restrictions due to Covid, the dire forecasts of college enrollment plummeting, due to the nationwide drop in the high school-age population, makes it difficult for our administration to justify large capital outlays.

Like schools across the nation, we have had to adapt to the circumstances created by Covid while maintaining the exacting standards of our program. As the dim light is just becoming visible at the end of the tunnel, we look forward to soon returning to face-to-face teaching. As we contemplate being able to resume what we love most, the prospect of eventually exploring and teaching in the fresh territory of virtual production is both exciting and inspiring. We passionately believe that virtual production has ushered in a major paradigm shift in production that will inevitably trickle down from major Hollywood productions to extremely low-budget indie productions. Educating the workforce of tomorrow, as they explore the creative potential of this recent technological development, will undoubtedly become a passion for the faculty involved.

Benefit to the Community

The 3D, game, and video production/sound design specializations in the MAS program have faculty and alumni that are successful locally, nationally, and globally. With the virtual production certificate, we will be able to bring together and leverage these three disparate specializations in our MAS program. With virtual production facilities and equipment, our classes and certificate program will be one-of-a-kind in the Midwest, but more importantly, it will bring us together to tell top tier stories and create highly innovative educational experiences for our students. Further, this would be a public-facing undertaking in which our students employ the facilities and techniques to support creatives, startups, and non-profits in their storytelling and marketing. Being located at the Crossroads of America is a big advantage for our school and city, as we are a few hours from Chicago, Cincinnati, and Louisville.

The media arts and science program graduates approximately 100 students annually. A solid VP pipeline, a VP certificate program and our existing community partnerships would provide everything we need to support an exploding tech scene as more marketing, commercial, TV, and game companies develop in the Midwest. Our students would be well-prepared to contribute to the work of media companies in Chicago, Atlanta, and beyond. With this grant, we would continue to support the common aspirational dreams of all our students: to be prepared to work on the biggest projects with the best skills in the world, from our own backyard. Such a facility would empower and recharge our team tenfold and bring the best locations on the planet into our virtual production spaces.

Furthermore, the establishment of a virtual production certificate in Indianapolis has the potential to generate an industry in this city and region that does not currently exist within this space. Virtual production in Indianapolis can contribute to our vibrant arts scene and to the revitalization and redevelopment of the Historic Indiana Avenue situated right next to our university. This road was home to one of the most prominent

black neighborhoods in Indianapolis and had a vibrant music scene. In partnership with IUPUI, the historic Madame Walker Theatre on Indiana Avenue was refurbished and will soon host film screenings, theater performances and other cultural events. These new partnerships in our community combined with our virtual production curriculum would benefit the campus and Indianapolis theater and arts organizations that often partner with our school and students to put on productions.

The Curriculum

The curriculum structure of MAS allows students to work within and across the various disciplines in our program. This affords students the ability to enhance skill sets that augment a specific area of study while still getting a broad view of MAS. Virtual production is a perfect production tool to give students a medium to combine wide ranging areas of interest such as game design, 3D production, and video production.

A virtual production specialization is a natural extension of our game development, video production, and 3D design specializations. Our game development specialization has been taught using Unreal Engine for over a decade. Students from this specialization have been recognized for their skill by being awarded best in show at Vector Conference, accepted to showcase at MAGFest, and securing jobs at Blizzard, Riot, and Rockstar games. Our video production track teaches narrative and documentary production, interactive video, video-mapping, and 360° video. Student accomplishments include official selections of Tribeca Film Festival, Heartland Film Festival, Indy Film Festival, screening on PBS (Public Broadcasting Service), three regional Emmy Awards, the Audience Choice Award at Indy Shorts Fest, Audience Choice Award at Indy Film Festival, Grand Prize for Indiana Spotlight Film at the Heartland Film Festival, and the Kodak Motion Picture Film Bronze Award for Excellence in Filmmaking. Job placements include Netflix, The Field Museum, Complexly, New Fields, and The University of Notre Dame, with many graduates doing freelance work or starting their own production companies. Finally, we have a robust 3D design track that is filled with students experienced at photogrammetry, basic virtual production, and film-ready asset creation. These students have landed jobs in related international industry heavyweights such as Rockstar games, Pixar, MPC, Sony Imageworks, Digital Domain, Cantina Creative, Pipeworks, EA Sports, and Kohls.

Location

Our school is in an ideal location to capitalize on an investment in virtual production education. Our school is located within Indiana's capital, which has become an emerging tech hub of the Midwest. In Indianapolis, tech giants such as Salesforce and Eli Lilly provide talent and momentum to both the technological and creative fields. Around these companies a vibrant arts community has sprung up that puts on plays, produces, and screens films, and builds games in Unreal Engine. The media arts and science program, with an enrollment of more than 450 students and over twenty faculty members, makes its parent department (human centered computing) the largest

department in the school, giving us a large pool of students to funnel in a virtual production program.

Our school is particularly well-positioned to provide education and opportunities for underserved populations. Being a state university in the largest city in Indiana means a critical part of our mission is making the skills and technology we teach accessible to our diverse inner-city student body. In 2015, our school launched the informatics diversity-enhanced workforce (iDEW) program, an initiative to foster diversity in hi-tech. IDEW prepares students for success in technology programs by providing a full-curriculum to students in high school, teaching them user experience, programming, game development, and internet-of-things skills. Donors such as Salesforce, JP Morgan Chase, and Interactive Intelligence have all contributed financial support to this program. Recently, the program has been awarded a contract to provide training to all high schools in the state of Indiana. Learn more about the initiative at <https://soic.iupui.edu/idew/about/>.

The students who come through this program have a high rate of college attendance, and many choose to spend their time at our school. Grants provided to our school will directly benefit these students by providing them with cutting-edge skills to prepare them for jobs in the national workforce. We make sure these students are exposed to these jobs and professionals through the world's oldest ACM SIGGRAPH Student Group, [SIGGRPAH IUPUI](#) and an innovative study abroad program for our undergraduates called '[Hoosiers in Hollywood](#),' a program that assists students in obtaining positions and housing in LA, before graduation.

The Reel

Given that this proposal is not for a specific virtual production, but rather for an educational offering, we thought it made sense to include a reel of student work that shows the level of talent that comes through our various specializations. We have also included a prototypical example of a virtual production made specifically for this proposal. You can find the reel, our faculty's passion for VP, and a student led production all at <https://soic.iupui.edu/megaqgrant/>.

Project Budget

Before the dreams of this new curriculum, research and creative activity can be realized, we need to establish the pipeline that can make all this possible. That is where this grant proposal comes in.

We have read. We have researched. We have studied. And we have a solid idea of what is needed to make the virtual production pipeline a reality in an education environment.

After crunching the numbers, it breaks down as follows:

Midwest Virtual Production Training Hub-Budget

Production equipment: cameras, lighting, rigging, etc.	\$135,608.00	
Space Modification	\$100,000.00	
Post-production lab upgrade	\$138,960.00	
Training	\$40,000.00	
Total Direct Costs	\$414,568.00	
UNIVERSITY INDIRECT COSTS @ 20%	\$82,914	
TOTAL		\$497,482

Infrastructure/equipment (\$274,568): We need to upgrade our editing and post-production lab computers, as well as our on-set production gear and camera, computer, and deck link for Virtual Production. In addition, we need motion tracking for cameras and lights to synchronize with their virtual counterparts in Unreal. With all this gear we will have the tech, facilities, and knowledge.

Space Modifications (\$100,000) We currently have a dedicated 18x30 green screen space that is mostly idle. We would like to redesign it to better utilize the width of the room and add sliding doors to our hallway-sided wall to increase distance we can shoot into the room from a wider angle.

Training (\$40,000) We are currently speaking with Gnomon School of Visual Effects, Games & Animation and other VP curriculum creators to train our faculty during summer 2022.

University Indirect Costs (\$82,914) The cost of conducting sponsored programs includes both the directly identifiable costs (e.g., salaries, supplies, travel, etc.) as well as the physical and administrative infrastructure required to conduct such activity. Physical infrastructure includes the costs of constructing and maintaining appropriate facilities. Administrative infrastructure includes administrative support in the form of departmental administration, regulatory compliance, purchasing, human resources, academic affairs and other critical support units required for carrying out activities funded by sponsored programs.

While we know this proposal is a large ask for a relatively unknown program, we can ensure that these funds would be resourcefully spent to maximize our students' educational experience and foster innovation in faculty and student research and creative activity. This is not an all or nothing proposal. If Epic can provide any grant funds toward our efforts, we would be most appreciative.

Thank you so much for your consideration.

Personnel

[Extended Bios](#) available on our Megagrant Proposal website

Below, please see the specializations and bios from the various faculty members involved in this proposal.

Travis Faas

Travis Faas brings his experience building websites for Madison Square Gardens and several NBA teams into the classroom, teaching students how to build interactive media experiences that combine technical proficiency and an eye for artistry. He has written several introductory texts on game development that have been used as resources in universities nationwide. His interactive media has been shown at several academic venues, such as Meaningful Play and Games, Learning, and Society. His mentees have had their work shown at MAGFest Indie Arcade, the Intel Games Showcase at the annual Game Developers Conference and were awarded best in show at Vector Conference 2018.

He is pursuing a Ph.D. in human-computer interaction, with specific interest in the programming and game development communities of practice found on live streaming sites such as Twitch.tv. <https://soic.iupui.edu/people/travis-faas/>

C. Thomas Lewis, MFA

C. Thomas Lewis is a senior lecturer in MAS, where he has developed the video curriculum and taught several courses in production since 2009. To all the courses he teaches, Thomas brings a strong dedication to storytelling and emphasizes the development of students' cinematography and editing skills to best serve their storytelling. His passion lies in empowering his students to realize their story ideas through embracing the potential of digital technology.

In addition to teaching, Thomas has received multiple grants over the years, producing several health-related films and projection-mapping installations that address issues of climate change, HIV in Kenya, and the opioid crisis in Indiana. Prior to moving to Indiana, Thomas worked in production in Los Angeles for sixteen years after receiving his MFA in film from CalArts in 1993.

<https://soic.iupui.edu/people/thomas-lewis/>

Mathew Powers, MFA

Mathew A. Powers is at home in worlds both real and virtual, teaching how to turn interests such as video and traditional analog gaming, sequential narratives, and creature design into careers. He helps students to develop skills in original personal creation; collaboration between diverse minds and talents; team

building as needed by all creative industries; business planning; and project prototyping.

Focusing on 2-D and 3-D creation, virtual reality, and game world environment construction, exotic lifeforms for games and digital narratives, Powers' classes explore character, environment, narrative, and game creation.

<https://soic.iupui.edu/people/mathew-powers/>

Albert William

Since 2003, Albert William has been a research associate and lecturer in the School of Informatics and Computing's Media Arts and Science program. He teaches a range of 3D courses and specializes in three-dimensional design and animation of scientific content and digital heritage. He has directed a service-learning study abroad program to Greece for five years; there students document cultural and historical artifacts by creating videos that include photography, 3-D reconstructions of ancient sites, and virtual reality.

He has been involved in project management and production for numerous projects with SOIC for organizations such as the Office of Naval Research/CRANE; Ruth Lilly Health Education Center; Eli Lilly and Co.; IU's School of Medicine, School of Dentistry, School of Nursing, the Center for Computational Biology; and other freelance work from local to international levels.

Some awards he has received include the 2003 Silicon Graphics Inc. Award for Excellence in Computational Sciences and Visualization at Indiana University, the 2016 award for Excellence in the Scholarship of Teaching, and the 2019 Trustees Teaching Award. He has been PI or Co-PI on approx. \$1.5 million of various research grants and contracts. <https://soic.iupui.edu/people/albert-william/>

Zebulun M. Wood

Zeb is a lecturer and co-director in the MAS program. He has developed the 3D specialization along with Albert William since 2013 and led curriculum, career advancement, and community outreach partnerships for the program since 2017. Zeb's courses center on virtual beings and VFX for games, films, and extended reality platforms and even extend to facial prosthodontic partnerships with IU school of Dentistry. He and his students invent new protocols, unexpected yet *epic (get it)* collaborations, but most importantly killer Indiana home grown student stories. His student's successes are his successes. Zeb advises the campus' [ACM SIGGRAPH IUPUI Student Chapter](#) (world's oldest) and the campus esports program, [Gamershall](#).

In additional to teaching, Zeb currently collaborates with the IU School of Medicine, Dentistry, Purdue School of Engineering and local startups on

research grants centered in VR's capability to affect brain changes, maxillofacial prosthodontic design fabrication, football helmet design, and innovating in k-12 education, respectively. Zeb's N420 Multimedia Production Design class has clocked nearly 50k hours of student service with startups, non-profits and campus collaborators, conferences, and companies in Indiana and around the world. <https://soic.iupui.edu/people/zeb-wood/>