

RESEARCH LIVE

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Bridging Divides and Building Trust

BY ELISE TAKEHANA

In contrast to the long and often solitary work of writing a book, for the past year, Prof. Joshua Spero has spent his time on collaborative work with students in part to build a closer relationship with Rhine-Waal University (RWU), a ten-years-young campus in our partnership city of Kleve, Germany.

After an 18 year career at Fitchburg State University and 13 years of public service in several roles including Senior Civilian Strategic Planner for the Joint Chiefs of Staff and National Security Analyst, at both National Defense University's Institute for National Strategic Studies and Fort Leavenworth, Kansas, Spero sees his life's work consistently forming a "seamless web bridging theory and foreign policy practice, with scholarship and public service career paths."

During those U.S. Government years, he helped develop cooperative security and collaborative policy-making models into real world policy and program implementation. Spero and his colleagues from many governments bridged their former political divides as Cold War enemies to build partnerships durable even with transatlantic tensions. Through formative federal public service, he developed an international relations methodology of educating students in simulation crisis management decision-making. And now admirably, he watches students grow as researchers and analysts, better prepared to handle a complicated, challenging world.

Spero can trace back each step of his journey. His 2018 book about bridging divides between middle and great powers, *Middle Powers and Regional Influence: Critical Foreign Policy Junctures for Poland, South Korea, and Bolivia*, itself 10 years in the making, grew out of his government

experiences. His background in international relations drove his interest in bringing students abroad, specifically to Poland in 2015 and 2017. And, the 2019 study abroad course expanded into the "Heart of Europe's" journey, forging bonds between RWU and FSU students thanks to Spero's fortunate collaboration with Dr. Klaus Hegemann, a Fitchburg High School foreign exchange student (1988), and Dr. Alexander Brand.

Despite tumultuous political times, Spero sees a bright future for his students because "our collegiate student leaders soon become society's leaders," working in government, think tanks, the military, global business, academia, international organizations, and non-profits. His current faculty/student joint research project with Hegemann and Brand includes FSU students Samantha Beauchamp, Theresa Dzierwinski, and Theresa Klobucher, in addition to RWU student researchers.

Their project, "How U.S. and European Collegiate Students Strengthen Transatlantic Trust with Partnerships," takes a broad view on post-World War Two institutions and relationship between the United States and Europe on diplomacy, politics, economics, business, security, defense, energy, climate, culture, and the arts. With faculty support, students are drafting the project's online survey for FSU and RWU collegiate student communities to take after spring break.

Spero, Hegemann, and Brand encourage students to concentrate the survey on trend analysis of U.S. and European perspectives to find common ground and mutual trust across both sides of the Atlantic. They challenge students to grapple with misperceptions too often

preventing them from seeing how they possess more in common than assumed.

Writing a survey for students from different cultures and language traditions is no small feat, but fortunately, 90% of the courses taught at Rhine-Waal are in English, a decision made to support a university whose student population is 50% international. Spero was scheduled to take his research assistant's team to RWU during spring break 2020 to sit down with Hegemann, Brand, and research assistant colleagues to plan the final phases of their online survey

and larger faculty/student research project.

Spero and his students will present preliminary findings of the survey at the Westminster Public Library's evening series "Great Decisions on Foreign Policy" in early April and possibly at the 52nd annual conference of the Northeastern Political Science Association in Boston next fall. Students will also live-stream a video-conference town hall with FSU and RWU audiences during our Undergraduate Research Conference on April 23rd. Spero and Hegemann also hope to expand their Fitchburg

State-Rhine-Waal collaboration to develop a double degree program over the next year.

For a peacemaker, policymaker, and scholar like Spero – whose work leads to reconciliations and who values the role of breaking bread over long meals – it is no surprise that his journey brought him to "connecting with students on a research level" so they too understand their role as leaders who build scholarly bonds and policy-making bridges across societies and around the world.

Ensuring Accessibility and Affordability Through the Library

BY ERIC BUDD

After 18 years at Fairfield University, Jackie Kremer came to Fitchburg State as the new Dean of the Library in 2018. Fitchburg State's mission, and its commitment to accessibility and affordability attracted Jackie to the position.

Due to her commitment to accessibility and affordability, Kremer has been helping to spearhead efforts to promote three things: Open Access, Open Educational Resources (OER), and Open Pedagogy. Open Access is a new publishing model where scholars publish their research so it is freely available online, rather than in traditional journals. Open Educational Resources are teaching and research materials, used in the classroom and released under an open license, that permit no-cost access. Open Pedagogies utilize different teaching styles that view students as the creators of information, rather than as merely its consumer. FSU, according to Kremer, is perfectly situated to be a leader in all three areas thanks to its commitment to accessibility and affordability.

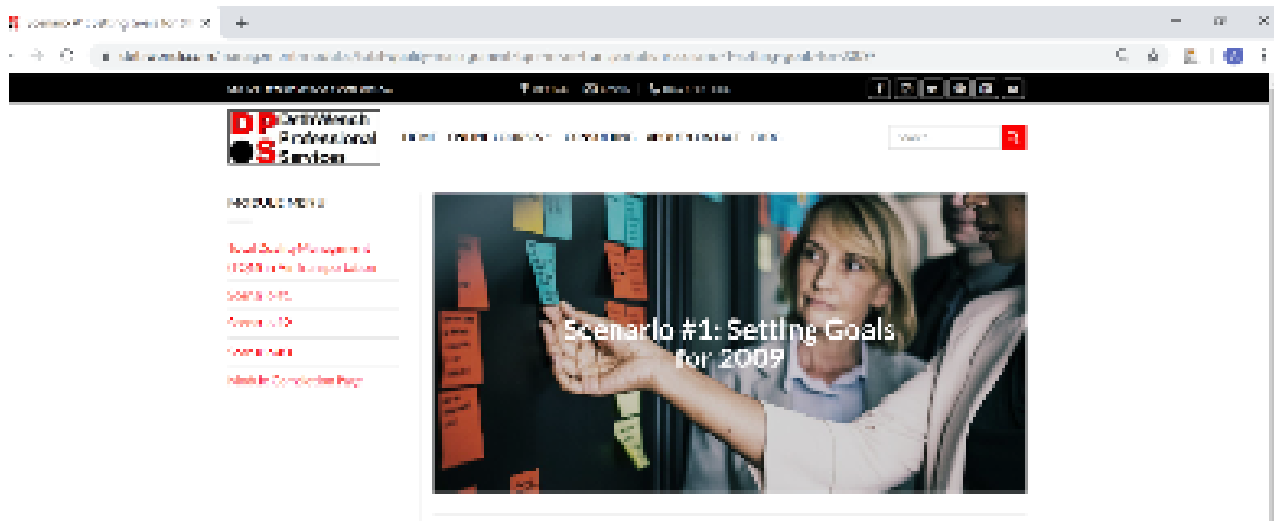
Change, whether technological or societal, has led to changes in libraries and the field of Library Science. Libraries once were repositories of knowledge, and the focus was on their collections. Collections are still important, but they represent only one piece of the puzzle. Today, librarians are "information experts," and use their expertise in information literacy to help students and faculty with their research needs. When asked whether these changes were democratizing access to information or creating a tiered system where only those at R1 institutions would have access to some materials, Kremer said that faculty

and students at schools like FSU are able to get access to a vast majority of information. This is because academic libraries function in a shared, collaborative fashion, so, if FSU students or faculty need something we do not have, we generally can get it from other libraries.

The needs of students, and faculty, are the driving force of some of the changes Kremer has implemented at the library. All of the library's journals were reviewed to ensure that we are buying what is needed, and data has been used to drive all acquisitions in the library's collection. How we deliver content has also been assessed, such that we have doubled our collection through the acquisition of e-books. The librarians are always thinking about what we want students to learn, and then working to achieve those outcomes in the classes taught, the materials added to the collection, and the ways they deliver information.

In the future, Kremer would like to strengthen the library's liaison program and develop a deeper partnership between faculty and librarians to support student learning and faculty scholarship. Through its research classes, embedded librarians, Research Guides for each discipline, and other programs the library staff is already doing a lot to ensure that students and faculty at FSU have access to the materials they need, and Kremer's commitment to accessibility and affordability will continue to shape how the library responds to future changes.

To learn more about OER and the work being done by FSU's OER Committee, go to <https://fitchburgstate.libguides.com/oer>.



Distant but Deep Learning

BY SAVANAH HIPPERT

Audrey Pereira, Associate Professor of Business Administration, used her sabbatical to expand her deep learning (DL) study. “Sabbatical gave me the opportunity to focus on my research so I could devote 40 hours a week on doing a literature review and having time to think ... that charged me up.”

With results from prior research comparing didactic knowledge, technical skills, and role modeling and ethics information learning between five online and face-to-face (F2F) sections of Introduction to Computer Information Systems over two semesters, she found that some types of learning are more difficult for students to grasp in an online setting rather than F2F and vice versa.

“Some students prefer an online environment. For example, say you have a student that has difficulty doing discussions in class—some students [may] raise their hands all the time [while] others are maybe quieter, maybe needed time to compose their thoughts. Those people might do better in an online environment because you’re having a discussion and then you have time to actually type up your answer before you submit it to Blackboard.”

The first phase of Pereira’s sabbatical project was to conduct a

comprehensive literature review on DL in order to produce a position on the state of that knowledge, present her findings at the Society of Business, Industry, and Economics (SOBIE) 2019 Academic Conference, then publish her research “Deeper Learning Methods and Modalities in Higher Education: A 20-year Review” in a peer-reviewed journal (accepted for publication in the *Journal of Higher Education Theory and Practice*). Pereira found, alongside several other findings, that while the research on deep learning in face-to-face instructional methods is a rich field, much less has been studied on the topic when it comes to online environments.

Pereira’s research suggests that curricula based on deeper learning principles (DLPs) engage the learner much more in game-based learning (GBL). To incorporate her findings into her teaching, Pereira applied for and received a Fitchburg State Special Projects Major Grant. Working with a consultant over Summer 2019, she created a gamified, roleplaying module to supplement a case study assignment in an online graduate course on management theory.

The gamified case study was on total quality management for British Airways and was offered to students as extra credit. About half of the

students chose to do the module, which provided Pereira with a control group. This deep learning module includes simplistic illustrations and detailed backstories of key players from the academic case study, giving students a better sense of why each player made the choices they did. The module also includes simulations and a debriefing, with easy navigation allowing students to move from one section to the next fluidly.

“I found the module extremely helpful,” one student said. “The last module was my favorite since it broke down each strategy and the steps. I really feel like I learned a lot and better understand how to apply [management theories]!”

While she is still processing data from both sections, the results from the first section (with data available for 57 out of the 61 students) suggest that the module improves DL for the case study assignment. Pereira is currently testing one more section and plans to write a paper on her findings.

While Pereira continues her work on DLPs and GBL, she suggests Snacks Daily Podcast for financial news for business students or those wanting to learn more about financial news in a more digestible format.

Feeling for Our Data

BY ELISE TAKEHANA

J.J. Sylvia IV, Assistant Professor in the Communications Media department, is currently focused on researching different ways of visualizing data, particularly in how humans might see themselves in big data. "Because Big Data is so abstract, it's hard to have it ever feel personal. It's hard to care about it."

His current line of research comes out of his observations of audience interactions with his previous digital installation piece *Apperveillance*, which displayed publicly available webcam images, open crime data, and an image captured by a computer's webcam while it is running the visualization. Audience members were most disturbed and disoriented by the piece's ability to capture their own image.

It's the construction of subjectivity and of seeing self in big data that draws Sylvia's attention to the impacts of living in a data rich society. He's currently working with a Game Design student and Film

and Video student to build augmented reality stories around concerns regarding how big data constructs our subjectivity. The current iteration looks at how car dealerships pull information from your mobile phone when you approach the lot so as to customize their negotiating strategies and offers.

For Sylvia and his students, this kind of highly personal information gathering is a problematic divergence from mass media equivalents. In the past, companies could gather large data sets, but they were used to construct offers that all consumers could partake in equally. Now, with the extreme personalization, individuals have no context for what others might experience.

This raises the question of whether or not scale or efficiency of data collection and application affects its ethical integrity. For Sylvia, who has a background in e-commerce programming and marketing, his larger question falls on when

persuasion turns into manipulation.

Sylvia entertains several lines of research including the ethics of big data and its visualization, maker pedagogies, and fake news, but he sees the underlying current to all this work in his interest in posthumanism, a belief in the idea that there is no "essence of humanity" separate from its technologies. From this ideological foundation, maker pedagogies simply offer new ways of seeing how humans interact with the world and fake news creates subjectivities that promote contrary or even radicalized views of the self.

Of course the implications of such practices go much deeper. For instance, critical thinking, the go to positive mentality of the academy, has itself been weaponized in the age of post-truth. As far as fake news goes, media literacy training has proven ineffective because it encourages pure skepticism, so that nothing can



appear true no matter the validity of the source.

His interest in maker spaces and the pedagogies of making, are ways to mitigate such weaponized skepticism. Instead of relying only on a critical mindset, people might experiment with their surroundings and apply theoretical ideas to their understanding of their environment. As an example, Sylvia once tasked his students with representing the world and environmental concerns with an Arduino, an electronic circuit kit.

They made a papier mâché globe and identified areas with higher pollution levels. When users touched the globe, it would scream and the volume would increase with the pollution levels of the corresponding location.

Sylvia's work bridges several disciplinary divides, drawing chiefly from rhetoric, philosophy, communications, and media studies. Moving between disciplines has given him more lens to look through. "I understand philosophy better because I do communications." Experiencing

disciplinary boundaries as porous made it seem more natural for him to identify with posthumanism and the digital humanities because they too reject disciplinary boundaries.

His most recent article looks at the shift from media archaeology to media genealogy, which he sees as a way to move the field from charting ways of seeing the world through technological developments to focusing on who we are, and can become, as subjects.

The CFS's Annual Faculty-Student Grants

Dr. Hong Yu worked on 2 projects with students, Joshua Lorraine and Cory Lo: "Integrating Computerized Sensors into Microcontroller Embedded Systems" and "Environmental Monitor System with Visual Analysis of Sensor Data."

Dr. Elyse Clark worked with her student, Alina Salaiz, on "The Effects of Road Salts on the Salinization of Freshwater Streams in the Fitchburg Area."

Special Projects Winners of 2019-2020

The Office of Academic Affairs supports research across campus through the Special Project Grants. Research supported this year includes a diverse set of projects including researching news deserts, small stream health, the fitness of firefighters, and Woodstock artists. Other colleagues took release time to research animalarial drugs, model elephant herds, and consciousness. Some faculty took on research assistants to measure physical activity of Fitchburg natives, create decision-making algorithms, find therapeutic interventions for muscular dystrophy, or research player relationships with game miniatures. Still more presented around the world on everything from myths of Christopher Columbus and coding pedagogies, to smart technology in construction and neural signatures of rhythm-induced trance states.

MAJOR GRANTS:

Jonathan Amakawa
Deborah Benes
Danielle Wigmore
Carolyn Gustason
Wafa Unus
Audrey Pereira
Jessica Alsup
Lindsay Parisi

MINI GRANTS:

DeMisty Bellinger-Delfeld
Steve Edwards
Daniel Welsh
Jason Talanian
David Hirst
Brandon Mgeni
Michael Hove
Lisa Grimm

COURSE RELEASE:

Dennis Awasabisah
Adem Elveren
David Svolba
Thomas Schilling
John Ludlam
Daniel Welsh
Benjamin Levy

UNDERGRADUATE RESEARCH ASSISTANTS:

Catherine Buell
Hong Yu
Eric Williams
Samuel Tobin
Ricky Sethi
Nirajin Mani
Carolyn Gustason
Deborah Benes

Danielle Wigmore

Adem Elveren
Christa Marr
Joshua Spero

CONFERENCE TRAVEL:

Nermin Bayazit
Catherine Buell
Katharine Covino-Poutasse
Hong Yu
Wafa Unus
J.J. Sylvia IV
Connie Strittmatter
Ricky Sethi
Nirajin Mani
Benjamin Levy
Megan Krell
Michael Hove

School Counselors and Warm Syllabi

BY KURTIS KENDALL

When it comes to being a student, having support is invaluable in order to succeed. Support can come in various ways and from numerous people, but it is nonetheless essential for students to thrive and lead fulfilling lives.

As someone who teaches one of these support systems, future school counselors, Dr. Megan Krell of Fitchburg State's Behavioral Science Department is interested in how she can better guide school counselors to be invaluable resources to their schools.

School counselors help students in the three main domains of academic, social/emotional, and career support. Though counselors have been assisting students in these areas for years, only recently has their licensure title reflected the work they've been doing. The Commonwealth of Massachusetts officially switched from using the title "guidance" counselor to "school" counselor two years ago to address the school-wide work counselors do every year. Krell, as past President and current board member of the Massachusetts School Counselors Association, was one of many counselor educators in the region who supported this more accurate title change.

Krell teaches counselors to become leaders in their schools and to work with all aspects of the system including the teachers, administration,

parents, and students. "One of the ways they can do that," says Krell, "is by doing whole school interventions where they're not just seeing the students who are in crisis but they are seeing all of the students; because that's the ultimate goal of school counselors."

Positive support can be another crucial factor of student success in school. While attending a workshop about how to become a better educator, Krell teamed up with a group of researchers all interested in how a positive or "warm" class syllabus impacts a student's perception of how they will do in that course. Data was collected over several semesters by researchers at various universities in the Northeast. Researchers gave fake syllabi to students that were either warm or cold in their language and presentation. Students were then asked how did they perceive the professor, what was their recall ability of assignments and information on the syllabus, and what grade would they expect from the class.

In all three of these categories, warm syllabi were more effective in syllabus recognition and positive outlook on course performance than

their cold counterparts. Instead of having a syllabus that highlights punishments and consequences of missing a certain number of classes or not doing an assignment to perfection, having one where policies and rules are clear in a warm and inviting way can go a long way in creating a better class environment all semester long. A simple and welcoming message, positive language and a sense of collective effort towards class goals can make the difference in communicating course value for students.

Based on the implications of her research, Krell would encourage other counselor educators like herself to consider using warm language in their syllabi. "We know that if students think that they will be successful in a class, then the likelihood of being successful increases." Though the study was looking at syllabi for counselor education courses, there's no reason to think that the introduction of warm syllabi in other departments wouldn't bring with it the same effect. Even that little extra bit of support can be a benefit for all students in the classroom.



Tips for Warm Syllabi

1. Utilize inclusive and collaborative language, such as "we will..." when possible.
2. Include supportive statements encouraging students to seek help if needed such as "The Tutor Center is free and helpful to students at all levels."
3. Positively frame your expectations for students. Focus on what students should be doing, rather than what they shouldn't do, e.g. "turn in work on time" rather than "do not submit late work."

Coaxing Pupae and Pupils

BY ELISE TAKEHANA

Erin Rehrig has reimagined her role as a researcher counter the R1 research mills and instead focuses on engaging students in becoming active researchers. Her senior level plant biology capstone is now a Course-based Undergraduate Research Experience, or CURE class. Students in the class conduct research that develops upon Rehrig's work on plant and insect health after silver nanoparticle exposure, which she collaborates on with Dr. Emma Downs in Chemistry and Dr. Catherine Buell in Mathematics.

Ultimately, Rehrig and her students are looking to discover how silver nanoparticles affect plants. Silver nanoparticles are often used as anti-microbials (such as on band-aids) and they cannot be filtered out of our environment, so we need to understand their effects. Dr. Buell designed an algorithm in MATLAB that helps students measure plant growth following nanoparticle treatment using digital images of the plants and measuring differences between weeks. Measuring plant growth is a real challenge for biologists since the process often harms or destroys the plant. The algorithm calculates what percentage of the image is plant and what percentage of the plant is still green and converts pixels to square centimeters.

While others are researching the impact of these nanoparticles, Rehrig's goal is to specifically look at how they affect plant growth over time and measure that using digital image analysis, which is new to the field. "It offers a way for students to almost measure any type of treatment. They can look at mutant plants, say plants that have a mutation in a specific gene, and then ask, how does this gene affect growth? You don't have to have a lot of fancy equipment to measure growth."

The students have to synthesize high quality nanoparticles (which they do in conjunction with Dr. Downs and her students), design the experiment, keep a meticulous lab notebook, and care for and treat the plants. There is no lab manual, just journal articles to examine methods and a workflow model for weekly lab responsibilities. While she initially thought the project would not be particularly exciting for students, she found it honest to the process.

"Research doesn't have to be hard. A lot of times it's repetitive and you have to do things over and over and over again."

While that may be the daily grind of lab research, her class has had its revelations too. She and her students recently found that silver nanoparticles do drastically affect root growth, which could explain an overall decreased growth rate.

Rehrig's lab is also looking into how these nanoparticles affect herbivory, particularly how much more or less susceptible exposed plants are to insect attacks. This portion of the research has been a challenge, since the cabbage butterflies they are using are not easily available through biomedical companies and their wild sourced caterpillars did not fair well. In trying to cultivate them in the Fall 2019 semester, only a few pupae hatched, but they were not interested in reproducing in their cages.

Once she is able to cultivate butterflies, she and her students will look into whether or not nanoparticle treatment of plants change the rate at which they are eaten by the caterpillars as well as how that

affects the caterpillar's health. "I have literally 200 pupae in diapause in a Tupperware container in my desk. And when the spring comes. We're going to start another colony."

For the plants, they are determining how silver nanoparticles might impair plants from protecting themselves against insect attacks. That line of research is novel to the field; no one has used digital image analysis to measure insect predation following silver nanoparticle treatment.

Rehrig hopes her work also helps cure her students of a significant issue in biology: plant blindness. "Even biology majors. You show them a picture of a beautiful forest and there's a sloth in the middle of the forest and ask, 'what do you see? I see the sloth.' They have plant blindness. They're not aware of all the plants that are around them as they walk through the forest."

Working with her students makes doing lab research at a teaching institution possible. She plans to continue this work in the fall when she is on sabbatical, but without her students. Since she will not be teaching classes, she will "have time to do the work of 15 people."

When Rehrig is not busy trying to entice butterflies to mate or guiding her students towards developing methods of measuring root growth nondestructively, she writes poetry and stand-up comedy in her head and sometimes even on the page. On her bucket list: perform a science-themed stand-up show.





Preserving the Architectural Spirit of a City

BY ELISE TAKEHANA

Following decades of work as a practicing architect, Keith Chenot is laser-focused on the value of knowing a building. His work is a loving dedication to not only preserving the original style of a building, but of knowing the architectural history it draws upon, of knowing its past usage, of considering its neighbors, inhabitants, and the lay of the land.

“Buildings are much like us. We do portraits of people, people have a presence to them. Buildings also have personalities. You can read those personalities.” Each building marks its time, not just in its appearance, but also by the technology used to construct it. And true to form, architectural innovations are both functional and, and if well designed, decorative and meaningful to those who experience them. For instance, the vertically laid, seemingly decorative bricks above the windows of Thompson and Miller Halls are technological modifications to the idea of the keystone, redistributing gravity around the window.

As the past owner and president of a small architectural firm, much of Chenot’s work included additions and renovations from replacing roofs to repairing belfries mired with pigeon guano, which frequently collided with preservation concerns. One of his first preservation projects was for a vacant three-story home in the Crown Hill district of Worcester. The home, with its impressive mansard roof, was bequeathed to Preservation Worcester, an organization for which he later served as President of the Board. Chenot’s firm did pro-bono work to plan a repurposing of the building as a multi-

family condominium and completed the exterior renovation.

Chenot brought his interest in preservation to Fitchburg and involved his students in designing community revival plans. In concert with Lisa Wong, then Executive Director of the Fitchburg Redevelopment Authority and future Major of Fitchburg, he brought his students to the Moran Square area to rethink its potential uses and set the tone for the eastern end of Main Street. Teams of students walked the area, did research at the historical society, and developed ideas for each building and vacant lot in the square.

Since the completion of their project, potential developers have asked for copies of the plans Chenot and his students made for repurposing of the area. Today, positive changes are happening. A new building for a food incubator/test kitchen has been built, and across the street, the old furniture store, its adjacent vacant lot, and the old brick fire station are being planned as a mixed-use commercial and multi-unit residential complex that will retain the historic fabric of the existing historic buildings.

Every year or so he and his students do another project in the city sometimes divining what could be built on one of its many vacant lots or how an existing structure could be reused. Students venture out in neighborhoods to observe how people interact with the space. They must consider more than the client’s desires, but equally the needs of the neighborhood since “the building is going to affect its neighbors and everyone passing by

it.” Architecture imagined in this way is community design.

Of course the decision to preserve a building, and by extension a community’s heritage, can be a costly endeavor wrought with controversy. Chenot’s students also prepared a design study of the central area of Main Street that included a preservation study of the Fitchburg City Hall after one of its roof trusses gave way in 2012. The decision to preserve the building was a hard-fought battle, for which Chenot suspects the university’s purchase of the theatre block helped influence the decision.

He is currently working to obtain access to the Old Courthouse on Monument Park, a three-story, granite, High Victorian building that has been vacant for years now. The 18,000 square foot building is a sizable project, but he is hopeful that a digital imaging service will donate a day’s worth of laser scanning of the exterior and some of the interior of the building. With that, he and his student can prepare a digital model of the building in the 3D software, Revit, and propose renovations or additions appropriate to their imagined reuse of the building. “Buildings last a lot longer than the way we currently may use them.”

Preservation begs the question, preserving what? Often primary concerns are repairing the structure and the exterior envelope of the building to improve its appearance. The purposes of a building evolve but the building remains as a part of the spirit of a city. For Chenot, while maintaining our heritage can be pricey, it’s also priceless.