PHILLIP HAMPTON EWING, JR.

(redacted)
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SUMMARY

Cross-disciplinary designer, researcher, analyst, developer, and educator exploring innovative solutions for the built environment—*and* the objects, processes, systems, and technologies which occupy and define it. Expanding upon a training in architectural design, professional experience includes (but is not limited to) 5+years of work on:

– Formulating parametric, generative, and simulation-based software tools for solving design problems;

– Conducting field measurements, occupant surveys, and pilot studies of photometric, thermal, and acoustical conditions (and associated psychometrics) in interior spaces;

– Integrated hardware production, including evaluating component datasheets, PCB layout and population, various digital fabrication processes, embedded programming and debugging, assembly integration, optical and servomotor calibration, and testing;

– Translating research in neuroscience, bioinformatics, artificial intelligence, atmospheric science, computer graphics, and other disciplines into insights relevant to designers; and,

– Communicating building technology topics and techniques to students, professionals, and researchers via peer-reviewed research, course curricula, lectures, and workshops.

EDUCATION

Massachusetts Institute of Technology (MIT) · Cambridge, MA
Master of Science In Architecture Studies (SMArchS), Design and Computation · 2015

THESIS · *Interactive Phototherapy: Integrating Photomedicine into Interactive Architecture*
CUMULATIVE GPA · 4.8 (of 5.0)

Auburn University · Auburn, AL
Bachelor of Architecture (BArch) · 2012
Bachelor of Interior Architecture (BIArch) · 2012

HONORS · *Magna Cum Laude*
CUMULATIVE GPA · 3.6 (of 4.0)

University of Alabama in Huntsville (UAH) · Huntsville, AL
(General Studies) · 2006-2007

CUMULATIVE GPA · 4.0 (of 4.0)

SKILLS

3D/CAD/CAE: 3ds Max · AutoCAD · Blender · Digital Project · Dynamo · EAGLE · Grasshopper · Inventor · Maya · Revit · Rhino 3D · SketchUp · SolidWorks

Analog Fabrication: Composites molding/casting · Microelectronics production · Model-making/prototyping · Plastics molding/casting

Building Simulation: ALFA · DIVA · Ecotect · Energy-Plus · IES VE · OpenStudio · Radiance

CAM: ABB Robot Studio · CNCjs · Fab Modules (MIT) · PartWorks 2D · SurfCAM

Digital Fabrication: 3D printing · CNC milling · Laser cutting · Vinyl cutting · Waterjet cutting

Libraries/Frameworks: Arduino SDK (C/C++) · Google Maps API (JavaScript) · Grasshopper SDK (C#, IronPython) · OpenCV (C++, Python) · TensorFlow w/Keras (Python) · Three.js (JavaScript)

Markup: CSS · HTML · Markdown

Media Creation: Dreamweaver · Final Cut Pro · Illustrator · InDesign · Inkscape · Photoshop · Premiere · Scribus

Programming/Scripting: C/C++ · C# · Java · JavaScript · LaTeX / BibTeX · Python · R · SQL

(Miscellaneous): bash · CMake · DOT · Git · HDF5 · libradtran · Mercurial · MS-DOS · Visual Paradigm (UML/SysML)

$$\vec{P_1} \in \mathbb{Z}^6$$

RECENT EXPERIENCE

Mango (Dx) Inc. · Huntsville, AL
Systems Analyst (Contractor) · January 2023 — March 2023

(Abstract) · Research and development of (a) a novel sub-pixel lensless microscopy system, (b) for antimicrobial susceptibility and bioburden testing, (c) for large-scale industrial pharmaceutical applications.

Analyzed and proposed improvements for prototype hardware design (particularly components and assemblies requiring additive manufacturing/ 3D printing processes) by reviewing parametric design models (SolidWorks) and test-fitting, modification, and assembly of physical prototypes.

Evaluated preliminary super-resolution reconstructed image results of microbial specimens, and proposed (potential) solutions for both system hardware design and software algorithm specifications.

Managed all aspects of hardware lab inventory and equipment, and evaluated suitability of prototype parts received from third-party vendors.

iCubate (MDx) Inc. · Huntsville, AL
Systems Analyst · May 2020 — September 2021

(Abstract) · Production of (a) a novel (US Patent No. 10,345,320), multiplexed, arm-PCR MDx platform, (b) consisting of "iC-Processor" machine for running automated biological assays, (c) on biological samples in a self-contained "iC-Cassette", (d) after which the results may be read by an "iC-Reader" machine, and (e) received by a desktop computer configured with "iC-Report" software for analyzing, displaying and storing assay results.

Oversaw and streamlined daily operations and increased system production rates for the hardware manufacturing lab, (a) per agendas perscribed by the (CTO and COO), while (b) enforcing compliance with iCubate's FDA-cleared quality system (QS) protocols regarding system production.

Performed specialized assembly, alignment, and/or calibration of micron-precision laser/optical and servomechanical sub-assemblies.

Documented any/all inventory transactions of hardware components and work-in-progress assemblies, or other materials.

Trained hardware technicians on procedures for hardware sub-assemblies, assembly inspections, testing, and related procedures.

Assigned assembly tasks and their priority levels to hardware technician individuals/teams to ensure product delivery deadlines.

Performed troubleshooting, diagnostics, and repairs on any malfunctioning production devices (both internal-use and customer-facing).

Verified all precision manufacturing test equipment received regular calibrations from a third-party vendor.

Developed scripts (Python) to extract and reformat pre-existing (PDF format) report data to aid in ongoing (internal) assay validation studies.

Assisted Senior Software Engineer on SQL database scripts for uploading special/preliminary sets of cassette data to a business management system (BMS; part of "iC-Report" software).

Advised quality system administrators (QS/QA) on any discrepancies, process changes, or other concerns encountered during hardware assembly runs or software validation, for revision to Standard Operating Procedures (SOPs) and subsidiary protocol documents.

RECENT EXPERIENCE (CONTINUED)

Perkins+Will · Atlanta, GA
Researcher · May 2016 – June 2019

(Abstract) · Initiated and/or collaborated with other researchers in a broad variety of topics advancing architectural technologies and design techniques. Further, responsibilities included advising/supporting specific project teams, especially by implementing "Design Space Construction" as a design workflow to (a) clarify architectural design requirements, (b) identify key performance indicators, (c) perform lighting and energy simulations on all (or selected) possible design permutations, in order to (d) evaluate effects of specific design parameters, thus leading to (e) data-informed decision-making and enhanced project performance overall.

Directly reported to the Director of Research for overall work, while also collaborating with Directors of "Neuro-architecture", "Energy" [Analysis], [Design] "Process", and "Building Technology" Labs for research, development, and/or consulting work on specific projects. An abridged listing of projects and activities, grouped according to role, is included in subsequent entries:

Primary Applied Research · (a) Unilateral software and hardware development of a wearable circadian light tracker (funded by an in-house research micro-grant); development of a tool for multi-dimension circadian light analysis; (b) front-end and mid-level software development (e.g. JavaScript, Three.js, shell-scripts) for "Simulation Platform for Energy Efficient Design (SPEED)" an internal software platform for design teams to perform mass-scale (e.g., 1000+ iterations in parallel) conceptual energy analysis simulations and analyses in "the cloud"; (c) continuing development of Design Space Construction (DSC), a software tool/workflow (Rhino |LN3D/Grasshopper & assorted plugins) allowing for data-informed decision making in the design process.

Secondary Applied Research · (a) Internal demonstrations and pilot studies (e.g. field measurements, data analysis) regarding techniques for evaluating architectural psychoacoustics and thermal comfort in pre-existing and completed client projects; (b) experimentation (hosted at Autodesk BUILD Space in Boston, MA) with developing techniques for architects to deploy processes involving simultaneous operation of multiple coordinated robotic arms for novel construction techniques (thermoplastic robotics), using previous work on thermoplastic latticework as a test case; (c) evaluation and advise of other researchers' work regarding development of an automated space plan generator (SPG) given programmatic requirements; (d) supervision (for the latter phase of) an ongoing study in the Atlanta, GA Perkins+Will office pertaining to the impact standing desks in the workplace ("Stand Up to Work").

Education · (a) Leading and/or contributing to workshops teaching designers how to apply research lab processes and tools such as design space construction, circadian light analysis, and other research lab developments to client projects in multiple Perkins+Will offices (e.g., Boston, MA; Seattle, WA; San Francisco, CA); (b) delivering workshops and/or lectures multiple universities (University of Washington in Seattle; University of Oregon, Georgia Institute of Technology; Auburn University) on aforementioned subjects.

Equipment Acquisition · Responsible for management and training other research lab colleagues on operation of sound level and noise dose meters, handheld spectrometers, a distributed ambient temperature and relative humidity sensor system prototype ("Pointelist"), and a smart flooring system, among other instruments.

TEACHING EXPERIENCE

Auburn University · **Auburn, AL**

Guest Lecturer · August – December 2018

Developed and presented three lectures, three workshops, and assignments on building performance analysis using the Design Space Construction workflow (Grasshopper, EnergyPlus, Radiance) to the entire 4th-year architecture student body in "ARCH 2220: Environmental Controls II" (Instructor: Prof. David Hinson, FAIA). Reviewed and graded student assignments.

Guest Lecturer + Critic · June — August 2018

Presented two lectures on acoustics and lighting analysis to 4th-year undergraduate students in "ARIA 4030: Interior Architecture Thesis" studio (Instructors: Profs. Kevin Moore, Matt Hall, Lida Sease). Conducted two desk critique sessions and participated as a juror for midterm and final reviews.

Guest Critic · April 2018

Invited and attended as a design juror to review undergraduate thesis student projects for "ARCH 5020: Thesis Studio" (Instructors: Profs. Justin Miller, Randal Vaughn).

University of Washington · **Seattle, WA**

Guest Lecturer · October 2017

Co-presented a lecture and on circadian light analysis (Grasshopper, Radiance, Python) for graduate students in the seminar course "ARCH 526: Topics in High Performance Buildings" (Instructors: Prof. Chris Meek, Devin Kleiner, Heather Burpee) as part of a workshop on the Design Space Construction (DSC) workflow for building performance analysis. Co-wrote the documentation and instructions on running (DSC) workflow.

Guest Lecturer · October 2017

Co-presented a lecture on circadian light analysis (Grasshopper, Radiance, Python) and conducted desk critiques of projects for graduate architecture students enrolled in "ARCH 504: Graduate Design Studio" (Instructors: Prof. Chris Meek, David Kleiner).

Singapore University of Technology and Design (SUTD) · **Singapore, SG** · *and*

Massachusetts Institute of Technology (MIT) · **Cambridge, MA**

Research Assistant · June – August 2013

Developed a curriculum for an introductory class on Building Information Modeling (BIM) for the Singapore University of Technology and Design (SUTD; in collaboration as a 'sister' university of MIT), emphasizing BIM as part of a larger conceptual framework incorporating digital fabrication workflows and "digital twins" for building operation and monitoring. Produced semester-long course syllabus, content plan, and the first five weeks of: lecture outlines, step-by-step lab session instructions, digital models (Revit), and student assignments.

Auburn University · **Auburn, AL**

Student Instructor · August 2011 – May 2012

Developed teaching materials and instructed workshops on Rhino, Grasshopper, and design application interoperability for undergraduate and graduate architecture students. Advised on the development of additional digital media workshops.

TEACHING EXPERIENCE (CONTINUED)	**Auburn University** · **Auburn, AL**

Teaching Assistant · August – December 2010

Led lab sessions and evaluated student work for undergraduate students in "ARCH 1000: Introduction to Careers in Design and Construction" (Instructor: Prof. Tarik Orgen).

EARLIER EXPERIENCE

The Freelon Group · **Durham, NC** · *(joined Perkins+Will in March 2014)*

Intern · June – August 2012

Produced schematic design drawings, digital models (Rhino, SketchUp, Revit), presentation boards (Illustrator, InDesign) for multiple renovation projects and proposals, including: Martin Luther King Jr. Memorial Library (Washington, DC); North Carolina Museum of History (Raleigh, NC); John Avery Boys and Girls Club (Durham, NC).

Intern · May – August 2010

Created schematic design drawings, digital models (Rhino, SketchUp), physical models, and presentation boards (Illustrator, InDesign) for several higher-education and museum projects and design bids.

Produced presentation slides, diagrams (Illustrator), and videos (Adobe Premiere) documenting the office's portfolio of design work, including the Smithsonian National Museum of African American History and Culture (Washington, DC), the Harvey B. Gantt Center (Charlotte, NC), and other projects.

Worked directly with the company president on pre-design precedent studies and drawings for the Freelon > REACH exhibition (Wolk Gallery, MIT Department of Architecture; Cambridge, MA) and accompanying booklet, as well as design studies for a limited-edition coffee table (manufactured by Herman Miller).

PEC Structural Engineering, Inc. · **Huntsville, AL**

Intern · May – August 2007

Updated 'red-lined' revisions to construction drawings (AutoCAD), and assisted in on-site inspections and documentation of various municipal and single-family residential projects.

Bentley Systems, Inc. · **Madison, AL**

Intern · May – August 2006

Conducted tests on eWarehouse, an application for plant operators to manage maintenance of industrial equipment. Reported and tracked trouble reports and change requests via database (FlawTrack). Created MS Excel macros to organize trouble report and change request data.

AWARDS + RECOGNITIONS + AFFILIATIONS

3RD PLACE, COLLEGE/PROFESSIONAL CATEGORY (2020) · HudsonAlpha Tech Challenge Hackathon (in collaboration with "The Missing Links" project team)

BOARD MEMBER (2019 – PRESENT) · Interior Architecture Program Advisory Council, Auburn University School of Architecture, Planning, and Landscape Architecture (APLA)

STUDENT CATEGORY FINALIST (2014) · Fast Company Innovation by Design Awards (in collaboration with MIT Media Laboratory Changing Places Group team)

ROBERT R. TAYLOR FELLOWSHIP (2012-14) · MIT School of Architecture + Planning (SA+P)

HONORABLE MENTION (2012) · Pella Design Portfolio Competition, Auburn University (APLA)

1ST PLACE (2011) · Student Design Competition, National Organization of Minority Architects (in collaboration with Auburn University NOMAS competition team)

$$\vec{P_5} \in \mathbb{Z}^6$$

AWARDS + RECOGNI-TIONS + AFFILIATIONS (CONTINUED)	1ST PLACE (2011) · Blackwell Prize in Drawing & Painting, Auburn University APLA
	FACULTY & STAFF AWARD (2011) · Auburn University APLA
	1ST PLACE (2011) · Pella Design Portfolio Competition, Auburn University APLA
	1ST PLACE (2010) · Architecture Writing Award, Auburn University APLA
	COOPER CARRY ARCHITECTS ANNUAL SCHOLARSHIP (2009) · Auburn University APLA
	DEAN'S LIST · Spring 2008, Summer 2008, Fall 2010 · Auburn University College of Architecture, Design and Construction (CADC)
	PRESIDENT (2011-12) · National Organization of Minority Architecture Students (NOMAS), Auburn University chapter
	5TH-YEAR STUDENT REPRESENTATIVE (2011-12) · American Institute of Architecture Students (AIAS), Auburn University chapter
	MEMBER (IND. SPRING 2009) · Golden Key International Honour Society, Auburn University chapter
	MEMBER (IND. SPRING 2009) · National Society of Collegiate Scholars, Auburn University chapter

PUBLICATIONS

Haymaker, J., Bernal, M., Marshall, M. T., Okhoya, V., Szilasi, A., Rezaree, R., Chen, C., Salveson, A., Brechtel, J., Hasan, H., Ewing, P. H., and Welle, B. (2018). "Design Space Construction: A Framework to Support Collaborative, Parametric Decision Making." *Journal of Information Technology in Construction (ITCon)*, Vol. 23, pp. 157-178. URL: *https://www.itcon.org/paper/2018/8*

Ewing, P. H., Haymaker, J., and Edelstein, E. A. (2017). "Simulating Circadian Light: Multi-Dimensional Illuminance Analysis." Presented at International Building Performance Simulation Association (IBPSA) Building Simulation 2017 conference, San Francisco, CA, USA, August 7-9, 2017. URL: *http://www.ibpsa.org/proceedings/BS2017/BS2017_660.pdf*

Ewing, P. H. (2015). "Interactive Phototherapy: Integrating Photomedicine Into Interactive Architecture." Thesis: S.M., Massachusetts Institute of Technology (MIT), Department of Architecture. Advisor: Kent Larson. URL: *http://hdl.handle.net/1721.1/99275*

SUPPLEMENTARY LINKS

PERSONAL WEBSITE · *http://www.phillipewing.com*

LINKEDIN PROFILE · *http://www.linkedin.com/in/phewing*

CITYHOME VIDEO · *https://www.youtube.com/watch?v=f8giE7i7CAE*

LaTeX 2ε source code for CV available on GitHub:

https://github.com/phewing/phewing-CV

$$\vec{P_6} \in \mathbb{Z}^6$$