HMC Architects

# HACKATHON

## COMPUTATIONAL DESIGN METHOD

OCTOBER 8-10, 2021

EVENT DETAILS

# DESIGN FOR GOOD.

FOUNDED IN 1940 WITH THE PURPOSE OF ANTICIPATING COMMUNITY NEEDS, HMC ARCHITECTS AIMS TO CREATE DESIGNS THAT HAVE A POSITIVE IMPACT, NOW AND INTO THE FUTURE. WE FOCUS PRIMARILY ON OPPORTUNITIES TO HAVE THE MOST DIRECT CONTRIBUTION TO COMMUNITIES–THROUGH HEALTHCARE, EDUCATION, AND CIVIC SPACES.

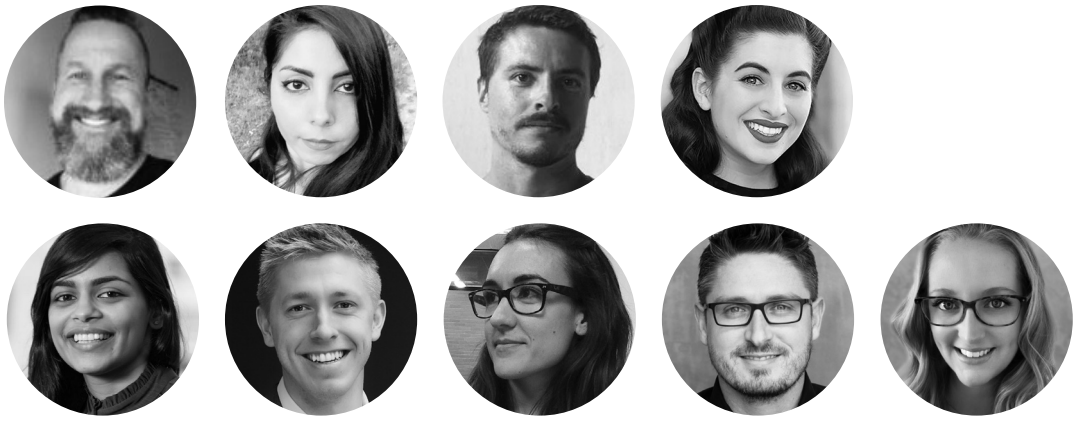
# 01 OUR TEAM

**NASH REYES**
Director of Digital Practice

Hackathon Role:
Event Manager

**BRITTNEY HOLMES**
Design Technologist

Hackathon Role:
Event  Moderator, Content Development



**DIGITAL PRACTICE / COMMUNICATIONS / VISUALIZATION**

Hackathon Role: Ideation, Workshops, Presentations.
Hackathon Marketing: Event Support, Web Page, Branding, and Event Communication.

# 1.1 EVENT SCHEDULE

**Schedule Overview**

*Virtually hosted on Pacific Standard Time*

**FRIDAY**

| | |
|---|---|
| Virtual Social Hour | 6:30 p.m. |
| Introduction to Hackathon | 7:00 p.m. |
| Project Pitches | 7:10 p.m. |
| Team Formations and Hacking Begins | 7:30 p.m. |
| HMC Soft Close and Saturday Agenda Review | 8:30 p.m. |

**SATURDAY**

| | |
|---|---|
| Morning Announcements | 8:30 a.m. |
| Hackathon Lectures and Workshops | 9:00 a.m. |
| Hacking Continues | 2:00 p.m. |
| HMC Soft Close and Sunday Agenda Review | 8:30 p.m. |

**SUNDAY**

| | |
|---|---|
| Morning Announcements | 8:30 a.m. |
| Hacking Continues | 9:00 a.m. |
| Hacking Concludes, Project Submissions | 12:00 p.m. |
| Judges Arrive | 12:30 p.m. |
| Presentations Begin | 1:00 p.m. |
| Winners Announced | 2:30 p.m. |
| Hackathon Concludes, Closeout | 3:00 p.m. |

**Event Hashtag:**
*#HMCHackYea*

# 1.2 HACKATHON THEME

The hackathon theme is based on the Computational Design Method (CDM), a process to guide a project team in organizing multiple design criteria around a common goal. Hackers will have the opportunity to present their ideas in response to their interpretation of the event theme. By the end, participants will have a working application with the ability to visualize the design decisions.

# 1.3 EVENT SPONSOR

IMAGINiT TECHNOLOGIES

As a Platinum Partner of Autodesk, IMAGINiT brings unparalleled design engineering knowledge and expertise including the recommendation, implementation, training and support of 3D design engineering software as well as consulting services to help companies in the manufacturing, civil infrastructure, architecture, engineering and construction industries, gain real competitive advantage on the path to innovation.

IMAGINiT has experts familiar with AutoCAD, Revit, Civil 3D, and Leica Geosystems software, which includes emerging technologies like reality capture and augmented reality. Our team is poised to help you achieve the most from your technology investment.

To learn more contact:
Marc Agins magins@rand.com
at IMAGINiT Technologies.

**Get More with IMAGINiT:**


*https://youtu.be/sxlVSBtKnaw*

# 02 EVENT PRESENTER

**DR. MOHAMMED MAKKI**
Co-Founder, Wallacei
Sr. Lecturer, University of Technology Sydney, Australia

**Title of Presentation:**

Multi-Objective Evolutionary Algorithms in Design: Theory and Applications

**Biography:**

Mohammed Makki is a senior lecturer at the University of Technology Sydney. He holds a Masters of Architecture degree from the Emergent Technologies and Design Program at the Architectural Association, as well as a PhD from the Architectural Association awarded under the supervision of Dr. Michael Weinstock. Mohammed's work is focused on advanced computational design methods and the application of biological and natural processes within the design process. As part of his research, Mohammed is the co-founder of the plugin Wallacei, an evolutionary and analytic engine for Grasshopper 3D that allows users to run evolutionary simulations and analyze the results.

# 03 EVENT WORKSHOPS

AUTODESK.

## DESIGN OPTIMIZATION AND EXPLORATION WITH AUTODESK GENERATIVE DESIGN

This workshop will focus on utilizing Dynamo and Autodesk Generative Design to effectively explore the design space though the lens of residential planning. The session will start with the use of Dynamo to create a parametric tool for the layout of residential units and means of evaluating a completed layout, and will then apply the tool to buildings on a site, layering in new evaluation metrics as needed. We will then utilize Generative Design to explore options though Random, Like This, and Optimization algorithms to find a desired layout, and discuss means to leverage the total sum of produced data as a means of verifying the selection and gaining further insight into the solver's navigation of the design space.

**Jacob Small**
**Designated Support Specialist, Autodesk**

After attaining his Bachelor of Architecture degree from Wentworth Institute of Technology, Jacob began his work at various offices in Massachusetts, where he gained exposure to many project types and scales. In 2017 he joined Autodesk as a designated support specialist, where he began putting his 10+ years of experience in the AEC industry and expertise with BIM and computational design to help some of Autodesk's largest customers succeed in applying new technologies to their daily project work.

**Aaron Tang**
**Developer, product owner of Dynamo, Autodesk**

Aaron worked on Revit for two years and Dynamo for five and half. Aaron is passionate about bringing the joy of visual programming to more users.

HYPAR

# COMPUTATION ON THE CLOUD WITH HYPAR

In this workshop, we'll show you how to bring the power of cloud computation to your design workflows using Hypar, the next-generation platform for designing and generating buildings. We'll cover building workflows from scratch on Hypar, and show you how to contribute your own functions with C# or Grasshopper.

**Andrew Heumann**
**Software Developer, Hypar**

Andrew is a software developer building computational tools for architectural design at Hypar. Prior to joining Hypar, Andrew was a senior researcher at WeWork, a design technology specialist at Woods Bagot, and the leader of NBBJ's Design Computation team. He has written more than 20 plug-ins for 3D modeling software like Rhino and Revit, including the popular "Human" and "Human UI" plug-ins for Grasshopper. He has created many bespoke tools for design teams and practices, aiding in the management of project metrics, environmental and urban analysis, and facade design.

**Serena Li**
**Software Developer, Hypar**

Serena joined Hypar in 2020 as a software engineer. Her architecture and urban planning background has inspired her to work on advancing design outcomes in the built environment via transparency, technology, and interdisciplinary collaboration. She has previously held design technology roles on Thornton Tomasetti's CORE studio, Kohn Pedersen Fox's Urban Interface team, and WeWork's Design Automation team.

# DISTRIBUTED COMPUTING WITH GRASSHOPPER

With the introduction of Rhino.Compute and Hops in Rhino 7, Grasshopper can be run on multiple processes and multiple computers to solve definitions in new ways. Learn how to break grasshopper definitions up in ways that multiple computers can participate in solving large definitions as well as having definitions solved on a server and controlled from a web browser.

**Steve Baer**
**Core Developer, McNeel**

Steve is a core developer for Rhino and has been part of the McNeel team for 18+ years.

Before McNeel, Steve practiced as a Naval Architect in Seattle working in the commercial workboat industry.

# 04 JUDGES

**BRIAN STATON**
President and CEO, HMC Architects
Los Angeles, CA, USA

As President and CEO of HMC Architects, Brian's collaborative leadership and commitment to partnering with clients to improve lives and communities through architecture is fundamental to setting the company apart as a leading design firm. With over 27 years of experience spanning all aspects of the architecture industry, including project management, programming, design, and construction administration, he leads with humility and is known for creating a diverse, positive workplace environment where others are empowered to do their best work. Brian's passion is the intersection of architecture and people, and he believes that HMC's success is attributed to its talented staff and clients.

**EVAN PATTON**
Development Lead, MIT App Inventor
Massachusetts Institute of Technology
Cambridge, MA, USA

Evan is the lead developer on MIT's App Inventor project. His aim is to help App Inventor users realize the full potential of their app ideas through the development of new components and features to aid in collaboration, rich data collection and visualization, and efficiency. During his time as a graduate student, Evan consulted on the PUNYA project to expand App Inventor capabilities for humanitarian causes, and he has consulted for a number of companies deploying Android and iOS applications. Evan completed his Ph.D. on optimizing reasoning software power consumption on smartphones at Rensselaer Polytechnic Institute (RPI) in June 2016 prior to joining the App Inventor team. He also holds a M.S. in Cognitive Science and B.S. in Computer Science and Psychology from RPI.

**INGALILL WALROOS-RITTER, FAIA**
Professor and Dean, Woodbury School of Architecture
Principal, WROAD Los Angeles, USA

Ingalill Wahlroos-Ritter is an architect, educator, and dean of the School of Architecture at Woodbury University. She has taught at Yale University, Cornell University, UCL Bartlett School of Architecture, and SCI-Arc over a twenty-year teaching career. Ingalill has collaborated on multiple award-winning projects including as façade consultant on *Bloom* with DoSu Architects, the Portland Aerial Tramway with AGPS, the Centre Pompidou exhibition, *Continuities of the Incomplete*, with Morphosis, and as project architect for the Corning Museum of Glass with Smith-Miller + Hawkinson. Ingalill has forged new pathways and launched programs that support her vision of education for all. Elevated to AIA's College of Fellows in 2018, Ingalill is the recipient of the 2016 AIA California Council Educator Award, was honored in 2018 with the AIA|LA Presidential Educator of the Year Award, and has been recognized twice, in 2018 and 2019, by DesignIntelligence as one of the nation's Most Admired Educators in Architecture and Design. In 2019, Woodbury School of Architecture launched 'Housing+'. The initiative culminated in an invitation for Ingalill to present at the United Nations Headquarters in New York City, for the 58th Session of the Commission for Social Development.

**JESPER WALLGREN**
Co-Founder of Finch
Sweden

Jesper is a leading expert, and has become a name synonymous with parametric design and automation within the AEC industry.

# 04 JUDGES (CONT.)

**MARIANA CABUGUEIRA**
Senior Architectural Designer
Zaha Hadid
London, United Kingdom

Mariana is an architect and urban designer from Portugal, she is a senior architectural designer at Zaha Hadid Architects, teaches at the Architectural Association in London, and conducts live workshops and global webinars with students. She graduated from the School of Architecture in Lisbon and the Politecnico di Milano. She moved to London to explore design and technology through the Postgraduate course: Design Research Laboratory (DRL) at the Architectural Association School (AA). Her research gravitates around parametric design; generative design, digital design, and the evolution of architecture through the use of technological means, such as robotic fabrication. Mariana joined Zaha Hadid Architects after graduating from the AA School in 2017. She is part of the competition cluster and is responsible for high-end design projects in the office. She has contributed to winning projects including Navi Mumbai Airport, Western Sydney Airport, Exhibition Centre Beijing, and most recently the Tower C in Shenzhen.

**MICHAEL HOEHN**
Senior Computational Design
Buro Happold
USA

Michael is an architect and senior computational designer who joined Buro Happold after completing his masters' of architecture from Columbia GSAPP and working with industry leaders at Sidewalk Labs to help define generative design methodologies and interactions across a multitude of scales.

He is currently the lead developer of the BHoM Life Cycle Assessment Toolkit, the 2020 AIA TAP Innovation award-winning entrant for design thinking. He also works to integrate industry-changing workflows on key projects across the firm. Alongside his efforts to develop the open source BHoM toolkits, he also works across multiple teams to increase functionality and awareness of the BHoM as an industry wide, open source solution to many complex problems.

**MICHAEL PRYOR**
CDO DesignMorphine
Computational Designer Nike NXT
Innovation, USA

Michael Pryor is a multi-faceted designer utilizing Rhino + Grasshopper, C#, Maya, ZBrush, Houdini and others. He is currently a computational designer at Nike NXT and the CDO of DesignMorphine. He has been involved in various major architectural works in the US, China, Dubai, and Lebanon.

Previously, he worked at Trahan, SOMA, OLI, and [AY]A on projects ranging from museums, housing, restaurants, furniture, products, exhibits and prototypes. Michael is the author of the popular Grasshopper 3D plug-in Pufferfish with over 100k downloads. He has been the tutor to workshops by the AA visiting school Paris with Louis Vuitton, 3D-Dreaming, Rese.Arch, MIT OSL, Harvard GSD, rat[LAB], PA, Meal, and DesignMorphine.

# 05 TECHNOLOGY SUGGESTED

## SOFTWARE

Autodesk Software

- Dynamo
- Revit 21 22
  - Generative Design for Revit 21 22
  - Dynamo Sandbox

McNeel Software

- Grasshopper
- Rhino
- Hops

Additional Plugins for Grasshopper

- Ladybug
- Honeybee
- Wallacei

Accounts to sign up for in advance:

- Hypar Account Membership
- Slack Account
- GitHub Account

## TECHNOLOGY

Technology will not be provided during the event. Participants are responsible for providing their own technology, software, and resources that they want to use.

## WORKSHOP REQUIREMENTS

Navigate to the event Slack channel to download workshop files. There will be instructions and a list of software requirements to participate in the workshop. These should be downloaded before the workshops begin to maximize your participation.

# 06 EVENT GUIDELINES

**THE RULES OF THE HACKATHON**

1. Teams must have a minimum of five members, but no more than seven members.
2. Teams should be made up exclusively of registered participants who are not organizers, volunteers, judges, sponsors, or in any other privileged position at the event.
3. All team members should be present at the event.
4. Teams can seek advice and support from organizers, volunteers, sponsors, and others.
5. Teams should do all hackathon work at the event.
6. Teams can use an idea they had before the event.
7. Teams can work on existing ideas. Hacks do not have to be "innovative."
8. Teams can work on an idea that they have worked on before. Participants must clearly define previously developed work versus newly created.
9. Adding new features to existing projects is allowed. Judges will only consider new functionality introduced or new features added during the hackathon in determining the winners.
10. Teams can use libraries, frameworks, or open-source code in their projects. Working on a project before the event, open-sourcing for the sole purpose of using the code during the event is against rule number five.
11. Teams must stop hacking once the time is up. However, teams are allowed to debug and make minor fixes to their programs after time is up. Teams must register on Saturday, October 9, by 2:00 pm form provided by the event staff.
12. Projects that violate the Code of Conduct are not allowed.
13. Teams can be disqualified from the competition at the organizers' discretion. Reasons might include but are not limited to breaking the Competition Rules, breaking the Code of Conduct, or other unsporting behavior.
14. Sign-up for HMC Hackathon is limited to 60 participants. After reaching capacity, we will add those registrants to a waiting list. We will notify wait-listed individuals when a spot opens up.

**CLICK THE BUTTON BELOW TO COMPLETE YOUR REGISTRATION:**

**REGISTER HERE!**

# 07 FAQ

### When is the hackathon?

The HMC Hackathon will kick off at 6:30 p.m. on Friday, October 8, and conclude at 3:00 p.m. on Sunday, October 10. This year's hackathon is an online event.

### What is a 'hackathon'? What if I don't code?

The term 'hackathon' is an event of any duration where people come together to solve problems. Typical hackathons are for people who know how to code, but this is not required to attend HMC hackathon. If you have an idea that you would like to develop, you are welcome to participate. With the help of other hackathon participants, you will find a valuable way to contribute to the event.

### What type of projects will people work on during the hackathon?

We encourage a diverse range of projects geared towards the hackathon event theme. A list of ideas for possible projects that hackers have initiated is available on the hackathon Slack channel. The Slack channel will be provided to you after registration is complete. If you don't see a project that you would like to join, or if you would like to pursue an alternative approach, you can do so on the channel!

### When should I team up with other people? How do this?

You do not need to form a team before the event. Use the Slack channel to find out about existing project proposals or to suggest a new one. Teams can form based on project pitches. Let other event participants know that you have a project you would like to pursue, share resources, and brainstorm solutions starting now!

### Can I bring a project that I'm already working on to the hackathon?

You can add new features to existing projects but cannot reuse code from a previous idea. Project judgment and awards is based on what you add to your project during the hackathon. If you already have a project underway, please submit your ideas ahead of time in the Slack channel. Your work may inspire others – we encourage you to team up to develop solutions together!



### Do I have to attend both days?

Participation during both days is not required. We understand and respect that you may have other obligations. We encourage everyone to partake in the event to the best of their abilities. Please inform your team of any schedule limitations at the start of the hackathon.

### Do I need to download workshop files, software, and plugins before the event?

Yes. We strongly recommend that workshop software and supporting plugins are downloaded before the event. The workshops are limited in time and don't want you to miss out because of technical difficulties. Workshop files and software requirements can be located in the event Slack channel.

**CONTACT**

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Brittney Holmes: Design Technology Specialist
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