

# Michael Cerny Green

New York City, New York \* (901)-606-2270 \* [mcgreentn@gmail.com](mailto:mcgreentn@gmail.com)

LinkedIn: [www.linkedin.com/in/michael-cerny-green](https://www.linkedin.com/in/michael-cerny-green) | Github: <https://github.com/mcgreentn>

Website: <http://mikecgreen.com> | Google Scholar: [Michael Green](#)

## EDUCATION:

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**New York University**, New York NY

*PhD – Artificial Intelligence and Video Games* - GPA: 3.83

*June 2022*

**Lehigh University**, Bethlehem PA

*B.S. – Computer Science and Business, B.A. – Classical Civilizations*, GPA: 3.68

*May 2016*

**Temple University**, Rome Italy

*Study Abroad Semester – Italian Art*, GPA: 3.59

*Fall 2014*

## PROFICIENCIES AND SKILLS:

**Languages/Libraries:** Python, C#, Java, Javascript, HTML, Scala, Pandas/Numpy, Plotly, React, Flask

**AI/ML:** Pytorch, Pytorch-Lightning, Evolutionary Algorithms, Tree Search, Deep Learning, Reinforcement Learning

**Cloud/Infra:** AWS (S3, Batch, EC2, DynamoDB, Lambda, Cognito), Docker, Kubernetes

## WORK EXPERIENCE:

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**Origen.AI**, New York, NY

Current Employer

*Artificial Intelligence Software Manager*

*April 2020-Feb 2022*

*Artificial Intelligence Researcher*

*November 2018-April 2020*

Founding employee of a private, AI-applied technology platform startup developing models for the energy industry.

- Successfully managed and executed platform deployment projects, capturing ~\$300k for company revenue in FY 2020.
- Effectively pitched to investors to close ~\$1m in seed funding in FY 2021.
- Responsible for the creation and maintenance of OriGen's artificial intelligence research and production framework using Pytorch and Pytorch-Lightning, accelerated computing using NVIDIA, containerized with Docker, and written in Python.
- Enabled the framework to be backend-agnostic, allowing to be plugged directly into the OriGen Proteus platform for production use, while also being compatible for standalone-usage with cloud-infrastructure such as AWS, GCP, and Azure.
- Built a scalable AI/ML research pipeline using Neptune, AWS Batch, and AWS S3 for rapid model training/validation/testing iteration on multi-gpu instances.
- Directly engaged with clients to transform platform use cases into engineering and research requirements.
- Published paper detailing a new network paradigm to solve non-linear partially differentiable equations using attention mechanisms and residual calculations (<https://arxiv.org/pdf/2105.07898.pdf>)

**Imbellus, Inc**, Los Angeles, CA

*May-August 2018*

*AI/ML Engineer*

~25 employee personal assessment startup.

- Worked on a 4-employee team doing research and development using tree search, evolutionary strategy, and reinforcement learning.
- Built an evolutionary level generator to dynamically train reinforcement learning AI agents to play assessment levels.
- Published research at the Reinforcement Learning in Games workshop at AAAI 2019.
- Optimized internal processes to facilitate AI creation and use for the software and research teams.

**Tri-Champion Development**, Bethlehem, PA

*June 2014-May 2016*

*Founder*

Private, 4-person video game development group.

- Managed the creation of the Stay Alive series, a pair of spaceship shooter games.
- Participated in the Global Game Jam (January 2015), a 72 hour mobile video game contest to build Kairos Manor, a thriller puzzle game.
- Competed in mobiLehigh, Lehigh University's mobile video game creation contest.
- Produced Cubes, a 3d reflexive dodging game, winning the "People's Choice Award" out of 25 games.

**PricewaterhouseCoopers**, New York, NY, *Cybersecurity Consultant Intern*

*June-August 2016*

**Lutron Electronics, Inc.**, Coopersburg, PA, *Software Engineering Intern*

*May-August 2015*

**FedEx Corporation – FedEx Services**, Memphis, TN, *IT Information Security Intern*

*June – August 2014*

**Retrans, Inc. Precision Logistics**, Memphis, TN, *IT Software Development Intern*

*May - July 2013*

## **RESEARCH AND PROJECTS:**

### **Automatic Video Game Tutorial Generation**

*July 2017-Present*

Using a novel graph-based rule representation for video game rules, creating AI that can generate tutorials for any video game, starting with games in the GVGAI framework.

- [\[2017\] "Press Space To Fire": Automatic Video Game Tutorial Generation](#) – Michael Cerny Green, Ahmed Khalifa, Gabriella A. B. Barros, and Julian Togelius – EXAG Workshop at AIIDE 2017.
- [\[2018\] Generating Levels That Teach Mechanics](#) - Michael Cerny Green, Ahmed Khalifa, Gabriella A. B. Barros, Andy Nealen, and Julian Togelius - PCG Workshop at FDG 2018
- [\\*\[2018\] AtDelfi: Automatically Designing Legible, Full Instructions for Games](#) - Michael Cerny Green, Ahmed Khalifa, Gabriella A. B. Barros, Tiago Machado, Andy Nealen, and Julian Togelius - FDG 2018
- [\[2019\] Intentional Computational Level Design](#) - Ahmed Khalifa, Michael Cerny Green, Gabriella Barros, Julian Togelius - IJCAI 2019
- [\[2019\] Automatic Critical Mechanic Discovery Using Playtraces in Video Games](#) - Michael Cerny Green, Ahmed Khalifa, Gabriella A. B. Barros, Tiago Machado, and Julian Togelius - FDG 2019
- [\[2020\] Mech-Elites: Illuminating the Mechanic Space of GVG-AI](#) - M Charity, Michael Cerny Green, Ahmed Khalifa, and Julian Togelius - FDG 2020
- [\[2021\] Game Mechanic Alignment Theory and Discovery](#) - Michael Cerny Green, Ahmed Khalifa, Philip Bontrager, Rodrigo Canaan, and Julian Togelius - FDG 20201

### **Automatic Video Game Play-testing Agents**

*September 2016-December 2018*

Using evolved Monte Carlo Tree Search AI and player modeling to automatically play-test video game levels for Minidungeons 2, a 2-D rogue-like, dungeon crawler.

- [\[2018\] Automated Playtesting with Procedural Personas through Evolution Based MCTS](#) - Christoffer Holmgard, Michael Cerny Green, Antonios Liapis, and Julian Togelius - TOG 2018
- [\[2019\] Two-step Constructive Approaches for Dungeon Generation](#) - Michael Cerny Green, Ahmed Khalifa, Athoug Alsoughayer, Divyesh Surana, Antonios Liapis, and Julian Togelius - PCG Workshop at FDG 2019

### **Deep Learning/Reinforcement Learning**

*May 2019-Present*

A collection of various projects involving Deep Learning or Deep Reinforcement Learning research.

- [\[2019\] Evolutionarily-Curated Curriculum Learning for Deep Reinforcement Learning Agents](#) - Michael Cerny Green, Benjamin Sergeant, Pushyami Shandilya, and Vibhor Kumar - RL Workshop at AAAI 2019
- [\[2020\] Bootstrapping Conditional Gans for Video Game Level Generation](#) - Ruben Rodriguez-Torrado, Ahmed Khalifa, Michael Cerny Green, Niels Justesen, Sebastien Risi, and Julian Togelius - COG 2020
- [\[2021\] Physics-informed Attention-based Neural Network for Solving Non-linear Partial Differential Equations](#) - Ruben Rodriguez-Torrado, Pablo Ruiz, Luis Cueto-Felgueroso, Michael Cerny Green, Tyler Friesen, Sebastien Matringe, and Julian Togelius - Arxiv

\*Best Paper Award

25+ published papers available upon request. Please see [Google Scholar](#) for more.

## ***ORGANIZATIONAL EXPERIENCE:***

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### **Programming Committees**

<i>Foundations of Digital Games (FDG)</i>	2018, 2019, 2020, 2021
<i>Conference on Games (COG)</i>	2019, 2020, 20201
<i>Procedural Content Generation Workshop at Foundation of Digital Games (PCG)</i>	2019, 2020, 20201
<i>Portuguese Conference on Artificial Intelligence (EPLA)</i>	2019
<i>User Experience of Artificial Intelligence (UXOF AI)</i>	2019, 2020, 20201

### **Other**

Local Co-Chairman of the AI for Games Summer School	2019
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