

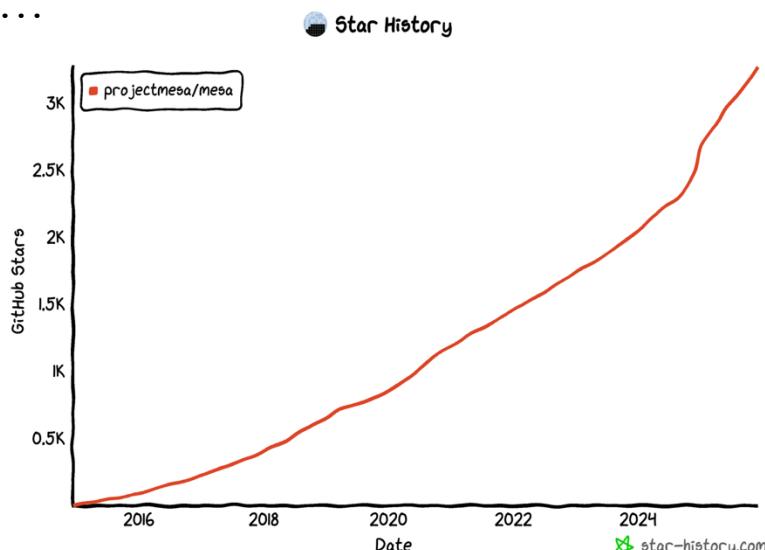
# Mesa 项目介绍

Boyu Wang

2025.12.07

# Mesa: Agent-Based Modeling in Python

- Open-source project created in 2014
- ~110k downloads per month (PyPI statistics as of Dec 2025)
- 600+ citations of three Mesa papers
- Used in various fields including health, energy, technical, biological, ecological...



## Mesa: Agent-based modeling in Python

[build](#) [passing](#) [codecov](#) [88%](#) [code style](#) [black](#) [in chat](#) [147 users](#)

Mesa is an Apache2 licensed agent-based modeling (or ABM) framework in Python.

Mesa allows users to quickly create agent-based models using built-in core components (such as spatial grids and agent schedulers) or customized implementations; visualize them using a browser-based interface; and analyze their results using Python's data analysis tools. Its goal is to be the Python-based counterpart to NetLogo, Repast, or MASON.



## Features

- Built-in core modeling components
- Flexible agent and model management through AgentSet
- Browser-based Solara visualization
- Built-in tools for data collection and analysis
- Example model library



# 其它 ABM 框架

## Non-Python

- NetLogo <https://ccl.northwestern.edu/netlogo>
- Swarm <https://www.swarm.org>
- Repast <https://repast.github.io>
- MASON <https://cs.gmu.edu/~eclab/projects/mason>
- GAMA <https://gama-platform.org>
- AnyLogic <https://www.anylogic.com>
- Agents.jl <https://juliadynamics.github.io/Agents.jl>
- krABMaga <https://krabmaga.github.io>

## Python

- Repast4Py <https://repast.github.io/repast4py.site>
- AgentPy <https://agentpy.readthedocs.io>
- PyCX <https://github.com/hsayama/PyCX>
- PyABM <https://github.com/azvoleff/pyabm>
- SimX <https://github.com/sim-x/simx>
- Melodie <https://github.com/ABM4ALL/Melodie>

# Mesa 用戶

- University at Buffalo
- TU Delft (Netherlands)
- University of Chicago
- University of Pisa (Italy)
- National Research Council of Italy
- Universidad Politécnica de Madrid (Spain)
- University of Illinois (Urbana)
- University of Mary Washington
- Mitre
- Princeton University
- George Mason University

“

... goal is to be a Python 3-based alternative to other popular frameworks based in other languages such as NetLogo, Repast, or MASON. ...

Masad, D., & Kazil, J. L. (2015, July). Mesa: An Agent-Based Modeling Framework. In SciPy (pp. 51-58).

”

# 参与方式



Small Development Grants<sup>1</sup>:

- 3 funding rounds per year
- 1 application per grant cycle
- max 2 grants per year
- up to \$10k for each proposal
- prior involvement in the project required (?)



## Google Summer of Code

- once per year for an open-source beginner or a student<sup>2</sup>
- small projects: 90 hours in 8-12 weeks, \$900
- medium/large projects: 175/350 hours in 10-22 weeks (default 12 weeks), \$1800/\$3600



## Google Season of Docs

- once per year for technical writers<sup>3</sup>
- \$5k-\$15k per project
- 5-30 hours per week, from April 10 to November 22 (2024)

<sup>1</sup> <https://numfocus.org/programs/small-development-grants>

<sup>2</sup> FAQ: <https://developers.google.com/open-source/gsoc/faq>

Contributor Stipends: <https://developers.google.com/open-source/gsoc/help/student-stipends>

<sup>3</sup> Google Season of Docs: <https://developers.google.com/season-of-docs?hl=zh-cn>

# 培训计划

## 第一阶段: 基础入门

- Mesa 框架入门
- 开源开发基础
- AI 辅助编程
- 模型实践进阶

## 第二阶段: 深度实践

- 空间模型实战
- 项目管理进阶
- 复杂网络上的多主体建模

## 第三阶段: 实践项目开发

- 社区参与与沟通
- GSoC 提案准备
- 真实项目实战

# 申请 GSoC 2026

## Start NOW

- 提前了解 GSoC 项目与流程
- 提前和 Mentor 或社区沟通，获得反馈，迭代你的想法
- 有时间熟悉 Mesa / 其它开源项目的代码与贡献流程
- 可以先做一些 small but real contributions (修文档、加测试、修小 bug)

## Useful Resources

- Mesa GSoC Candidates Guide:  
<https://mesa.readthedocs.io/latest/GSoC.html>
- Collection of accepted GSoC 2025 proposals:  
<https://gsocguide.vercel.app>
- Look beyond Mesa:
  - 找到你真正感兴趣的项目/领域/社区/技术栈 (e.g., [ABSESpy](#))
  - 不要只等这次培训的后续阶段，现在就开始调研与阅读代码

# 社区行为准则 Code of Conduct

## Contributor Covenant Code of Conduct

### Our Pledge

We as members, contributors, and leaders pledge to make participation in our community a harassment-free experience for everyone, regardless of age, body size, visible or invisible disability, ethnicity, sex characteristics, gender identity and expression, level of experience, education, socioeconomic status, nationality, personal appearance, race, caste, color, religion, or sexual identity and orientation.

We pledge to act and interact in ways that contribute to an open, welcoming, diverse, inclusive, and healthy community.

### Our Standards

Examples of behavior that contributes to a positive environment for our community include:

- Demonstrating empathy and kindness toward other people
- Being respectful of differing opinions, viewpoints, and experiences
- Giving and graciously accepting constructive feedback
- Accepting responsibility and apologizing to those affected by our mistakes, and learning from the experience
- Focusing on what is best not just for us as individuals, but for the overall community

Examples of unacceptable behavior include:

- The use of sexualized language or imagery, and sexual attention or advances of any kind
- Trolling, insulting or derogatory comments, and personal or political attacks
- Public or private harassment
- Publishing others' private information, such as a physical or email address, without their explicit permission
- Other conduct which could reasonably be considered inappropriate in a professional setting

### Enforcement Responsibilities

Community leaders are responsible for clarifying and enforcing our standards of acceptable behavior and will take appropriate and fair corrective action in response to any behavior that they deem inappropriate, threatening, offensive, or harmful.

Community leaders have the right and responsibility to remove, edit, or reject comments, commits, code, wiki edits, issues, and other contributions that are not aligned to this Code of Conduct, and will communicate reasons for moderation decisions when appropriate.

### Scope

This Code of Conduct applies within all community spaces, and also applies when an individual is officially representing the community in public spaces. Examples of representing our community include using an official email address, posting via an official social media account, or acting as an appointed representative at an online or offline event.

### Enforcement

Instances of abusive, harassing, or otherwise unacceptable behavior may be reported to the community leaders responsible for enforcement at [@jackiekazil](#) and/or [@edgemancho](#). Violations posted as Github comments, discussion, etc. maybe also be reported via the [report functionality](#). All complaints will be reviewed and investigated promptly and fairly.

All community leaders are obligated to respect the privacy and security of the reporter of any incident.

### Enforcement Guidelines

# Mentors

- 宋爽 · Shuang Song

- 马克斯·普朗克研究所 · 博士后研究员
- [cv.songshgeo.com](http://cv.songshgeo.com)

- 王博宇 · Boyu Wang

- 美国布法罗大学 · 博士生
- [wang-boyu.github.io](http://wang-boyu.github.io)

- 林鑫 · Xin Lin

- 中国地质大学（武汉） · 硕士研究生
- [github.com/peter-kinger](http://github.com/peter-kinger)

- 周正梓 · Adam Zhou

- 伦敦大学学院 · 博士生
- [github.com/AdamZh0u](http://github.com/AdamZh0u)

- 胡博 · Bo Hu

- 南京大学 · 博士生
- [hubo-home.com](http://hubo-home.com)

- 郭家乐 · Jiale Guo

- 米兰理工大学 · 硕士研究生
- [guojialegeographer.github.io](http://guojialegeographer.github.io)