Intuitive Containerization for ML inference with Garden

Will Engler
willengler@uchicago.edu
Accelerate Team

Ari Scourtas
Ben Blaiszik
Ben Galewsky
Logan Ward
Ian Foster
KJ Schmidt
Will Engler
Nick Saint
Ryan Chard
Kyle Chard
Tyler Skluzacek
Raf Vescovi
Noah Paulson
Isaac Darling
Mark Muchane
Max Tuecke
Phillip Kim
Chase Jenkins
Allison Daemicke
Jennifer Jin
Marcus Schwarting
Big Plans

- Benchmarking families of related models
- Hosting large models like (Alpha|Open)Fold and LLMs
- Tending Gardens as hubs for different subfields of scientific AI research
Nailing The Basics First

Currently solving for Chris*

*people who need to translate scientists’ GitHub repos into runnable & citable artifacts

- What is Chris* trying to do?
  - Getting models ready for a paper publication
    - Models are small (generally < 100MB)
  - Needs a DOI and metadata for citations
  - Not just citable, runnable
    - Hosted inference API
    - A way to use the models in a production workload
Both Sides

1. What does it look like for the consumer?
   a. We have a solid prototype
2. What does it look like for the publisher?
   a. We’re iterating on this
Consumer’s POV

- Find a Garden that’s relevant to you
  - Maybe you searched on thegardens.ai
  - Maybe you were linked from a publication
- Try it on your own data with the Garden SDK
  - Pull in a garden by its DOI
  - Calling methods on the garden launches a Globus Compute task that runs the ML function
Publisher’s POV (Chris!)

- Lots of prospective users currently use Colab to release models with papers
  - You can’t mess up your venv
  - You have a tight feedback loop between installing libraries and testing your code
Can We Get Close To That Ease Of Use?

- garden-ai notebook create –python 3.10 –flavor torch
- garden-ai notebook publish my-notebook.ipynb
How Publishing a Notebook Works

- Start: User points to a notebook. End: They see their updated Garden online with a new Globus Compute function attached to it.
- Process
  - Spin up the base container the user specified.
  - Run the contents of the notebook in it. Side effects like library installation are fine.
  - Use dill to save the state of the notebook interpreter in a session.pkl. Save it in the container.
  - Register the container with Globus Compute.
  - Register a function with Globus Compute that uses the container. The function loads the interpreter context and calls the function the user tagged with the @garden_pipeline decorator.
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https://www.materialsdatafacility.org

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https://www.dlhub.org

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Contact: KJ Schmidt (kjschmidt@uchicago.edu)
Thank You

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