

# Earth Science PROblems for the Evaluation of Strategies, Solvers and Optimizers

Espresso



Australian  
National  
University

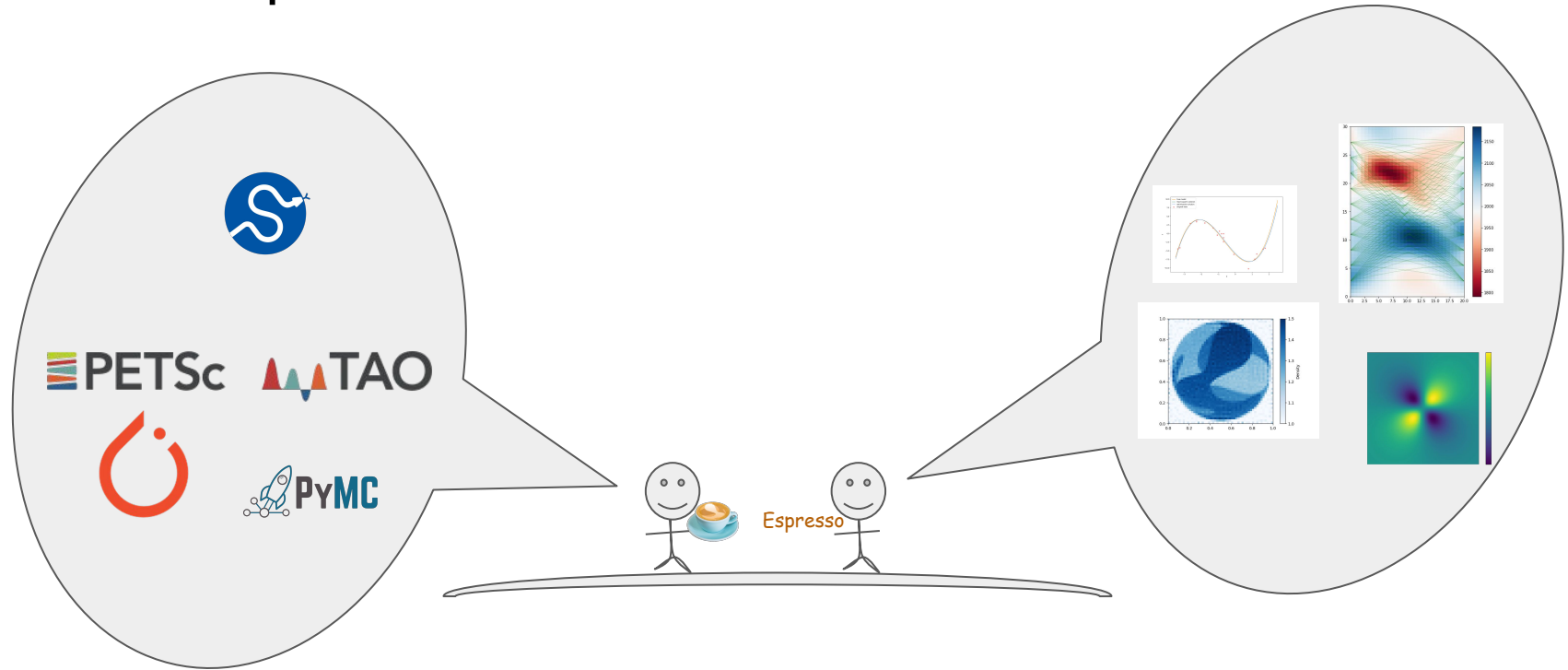


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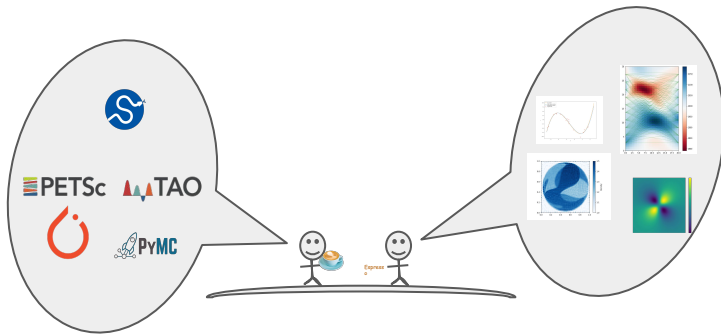
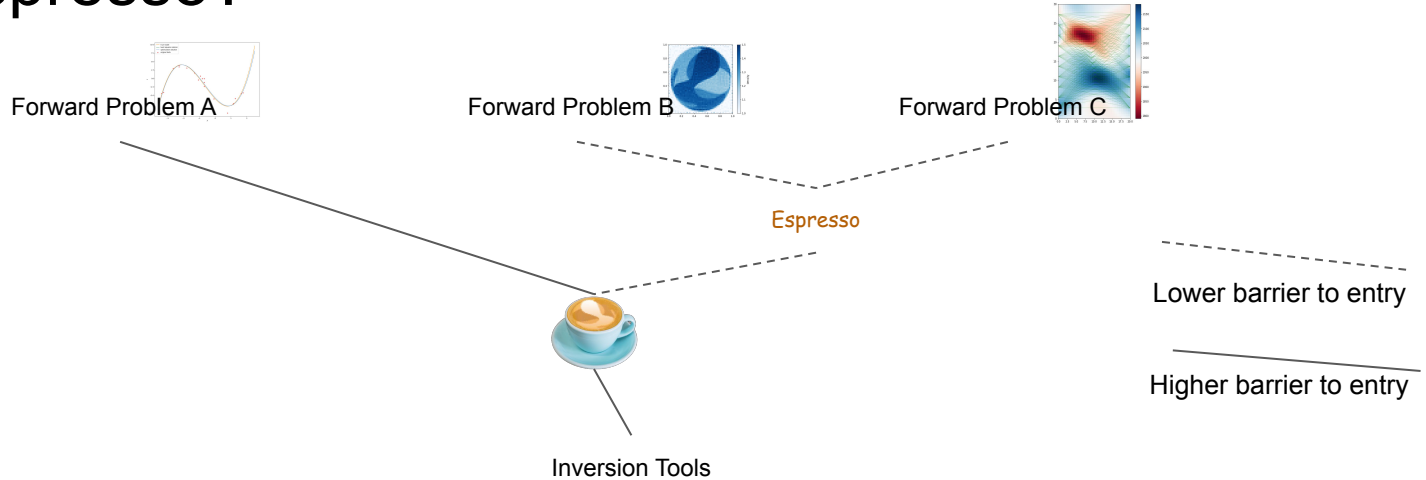
# What is Espresso?

- Real-world test problems
- Forward simulation codes + dataset
- Standard interface

# What is Espresso?



# What is Espresso?



	Users	Contributors
CoFI	Domain experts	Inference experts
Espresso	Inference people	Domain experts

# Who is Espresso for?

If you'd like to...

Then...

<u>Distribute</u> your benchmarking inference problem, make it available and portable	<u>Add</u> your example in Espresso
<u>Use</u> CoFI but don't know where to get started	<u>Add</u> your example in Espresso, then start from one of our CoFI example template
<u>Use</u> CoFI on your problem and know where to start	<u>Use</u> CoFI
<u>Develop, evaluate or benchmark</u> your inference algorithm	<u>Use</u> Espresso
<u>Distribute</u> your inference algorithm and make it available to the public	<u>Add</u> your inference algorithm code in CoFI

# How to use Espresso?

```
from cofi_espresso import XrayTomography

my_example = XrayTomography()

# minimum viable interface
model_good = my_example.good_model
model_ref = my_example.starting_model
data_obs = my_example.data
data_synth = my_example.forward(my_model)

# optional interface
jac = my_example.jacobian(my_model)
log_likelihood = my_example.log_likelihood(my_model)
figure_model = my_example.plot_model(my_model)
figure_data = my_example.plot_data(my_data)
print(my_example.description)
```

# How to use Espresso?

```
from cofi_espresso import GravityDensity

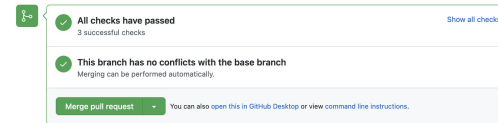
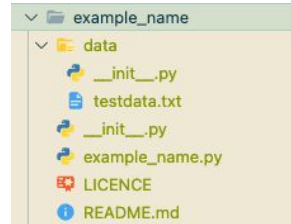
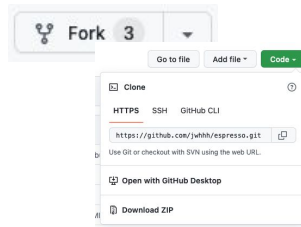
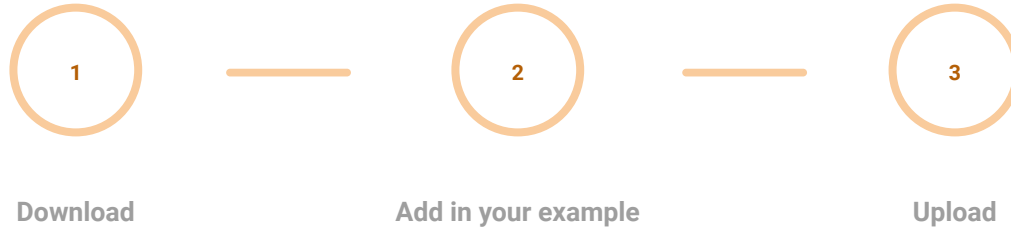
my_example = GravityDensity()

# minimum viable interface
model_good = my_example.good_model
model_ref = my_example.starting_model
data_obs = my_example.data
data_synth = my_example.forward(my_model)

# optional interface
jac = my_example.jacobian(my_model)
log_likelihood = my_example.log_likelihood(my_model)
figure_model = my_example.plot_model(my_model)
figure_data = my_example.plot_data(my_data)
print(my_example.description)
```

# How to contribute to Espresso?

You need: GitHub account + Python





# How to join the community?

- Join Slack: [inlab-community.slack.com](https://inlab-community.slack.com)
- Talk to us directly
  
- Students can write a short proposal to put a problem in Espresso (get paid!)
- Browse through GitHub & documentation (<https://inlab.edu.au/community/>) and let us know your feedback