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Rei Sanchez-Arias Teaching Projects Contact CV

Reinaldo (Rei) Sanchez-Arias

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Biography

I am an Assistant Professor in the Department of Data Science and Business Analytics at Florida Polytechnic University (Florida Poly). Before joining Florida Poly, I served as the Program Director for the MS in Big Data Analytics in the School of Science at St Thomas University (STU) in Miami. I was also part of of the Applied Mathematics Department at Wentworth Institute of Technology (WIT) in Boston, and completed a postdoctoral researcher appointment for the Army High Performance Computing Research Center (AHPCRC) at The University of Texas at El Paso (UTEP) in collaboration with a group at Stanford University. Research projects for the AHPCRC involved global optimization and parameter estimation, reduced-order modeling, and data analytics.

Interests

- Data Mining and Machine Learning
- Data Science Education
- Operations Research and Numerical Optimization

Education

- PhD in Computational Science, 2013
  The University of Texas at El Paso
- MS in Computational Science, 2011
  The University of Texas at El Paso
- BSc in Mathematics, 2008
  Universidad del Valle (Colombia)

Why Jupyter Notebooks?

A Jupyter Notebook is an open-source web application to create and share documents that contain ***live code***, ***visualizations*** and ***narrative*** text.

Jupyter notebooks are useful for data analysis, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

nanoHUB https://nanohub.org/tools/rjupyternb

proxy.nanohub.org/weber/1664256/ZJjp4hGJufmJ1zJ7/6/notebooks/Optimization.ipynb#3.-Two-dimensional-examples

nanoHUB jupyter Optimization (read only) Terminate Session

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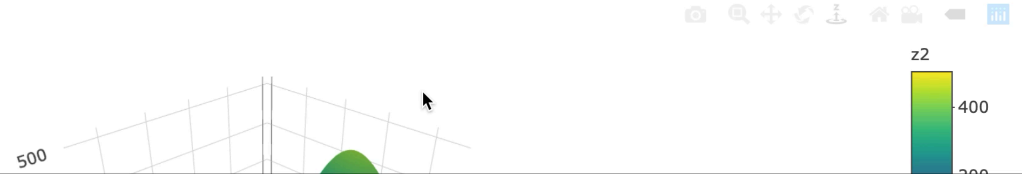
Example 2

Let $g(x, y) = (x^2 + y - 11)^2 + (x + y^2 - 7)^2$, which is called **Himmelblau's function**.

> To use the graph below:
>
> - Hover the mouse over the interactive graph to view the point values
> - Click and rotate the graph to view at different angles
> - Hover over graph and scroll to zoom in and out

In [15]:
```
g <- function(x1, y1) (x1^2 + y1 - 11)^2 + (x1 + y1^2 - 7)^2
x <- seq(-4.5, 4.5, by = .2)
y <- seq(-4.5, 4.5, by = .2)
z2 <- outer(x, y, g)
```

In [16]:
```
# Creating an interactive plot that can be rotated to view points at different angles
myp <- plot_ly(z = ~z2) %>%
      add_surface()
myp
```



Teaching with Jupyter Notebooks

Aim for and promote **reproducibility**
Use them in **class demos** and **homework** assignments

Notebooks can be **exported** as an .html file to share with others (e.g. students can easily upload them to your LMS)
Students get used to creating a *narrative*, explaining the *code* they use, and commenting on the *results*

proxy.nanohub.org/weber/1664248/iegCkYyRplq6rY1s/8/notebooks/HW_2_602_SP18_solutions.ipynb

jupyter HW_2_602_SP18_solutions Last Checkpoint: 2 minutes ago (autosaved)

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Models with `scikit-learn`

Loading a data set

We will load in the `digits` data set that comes with **`scikit-learn`**

In [9]:
```python
# ----------- Import `datasets` from `sklearn` -----------
from sklearn import datasets

# Load in the `digits` data
digits = datasets.load_digits()

# Print the `digits` data
#print(digits)
```

Note that the `datasets` module contains other methods to load and fetch popular reference datasets. You can check a list of available data sets and tools in the `scikit-learn` website.

Exploring the data set

You can access the `digits` data through the attribute `data`. Similarly, you can also access the target values or labels through the `target` attribute and the description through the `DESCR` attribute.

To see which keys you have available to already get to know your data, you can just run `digits.keys()`.

Jupyter Notebooks in nanoHUB

https://nanohub.org/tools/jupyter

Free to create an account

Explore sample notebooks contributed by the community

Share notebooks with students and others

Web-based tool: just need a web-browser, no installation needed, everything runs remotely in nanoHUB resources

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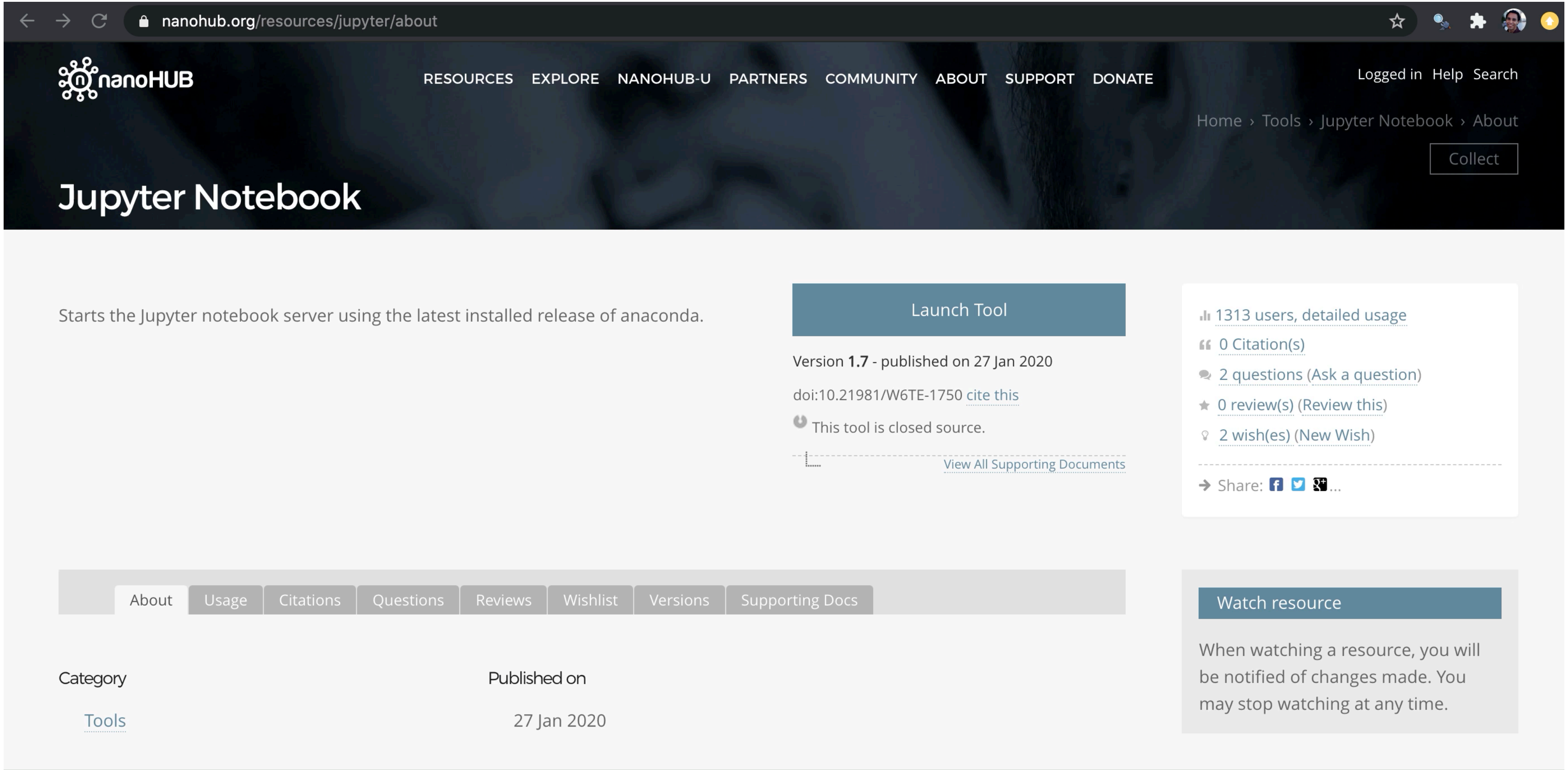
nanohub.org/resources/jupyter/about

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Collect

Jupyter Notebook

Starts the Jupyter notebook server using the latest installed release of anaconda.

Launch Tool

Version **1.7** - published on 27 Jan 2020

doi:10.21981/W6TE-1750 cite this

This tool is closed source.

View All Supporting Documents

1313 users, detailed usage
0 Citation(s)
2 questions (Ask a question)
0 review(s) (Review this)
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Watch resource

When watching a resource, you will be notified of changes made. You may stop watching at any time.

Category

Tools

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27 Jan 2020

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nanoHUB jupyter **sample_Python_notebook** Last Checkpoint: an hour ago (autosaved) Terminate Session

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Run Code Appmode Validate

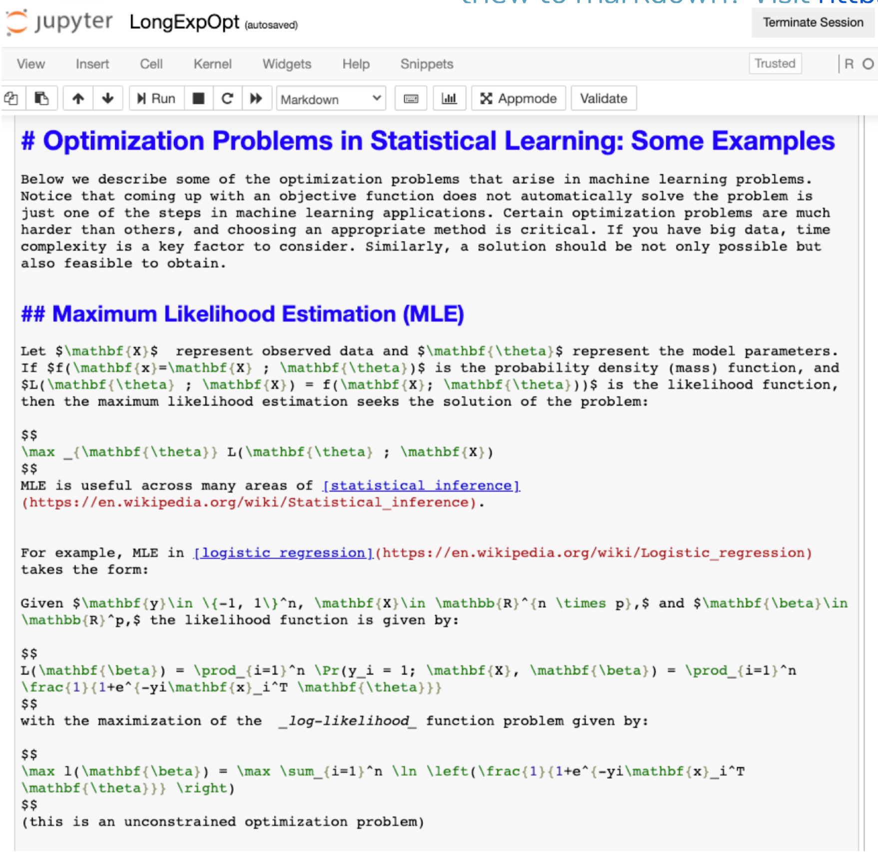
In [1]:
```
pip list
```

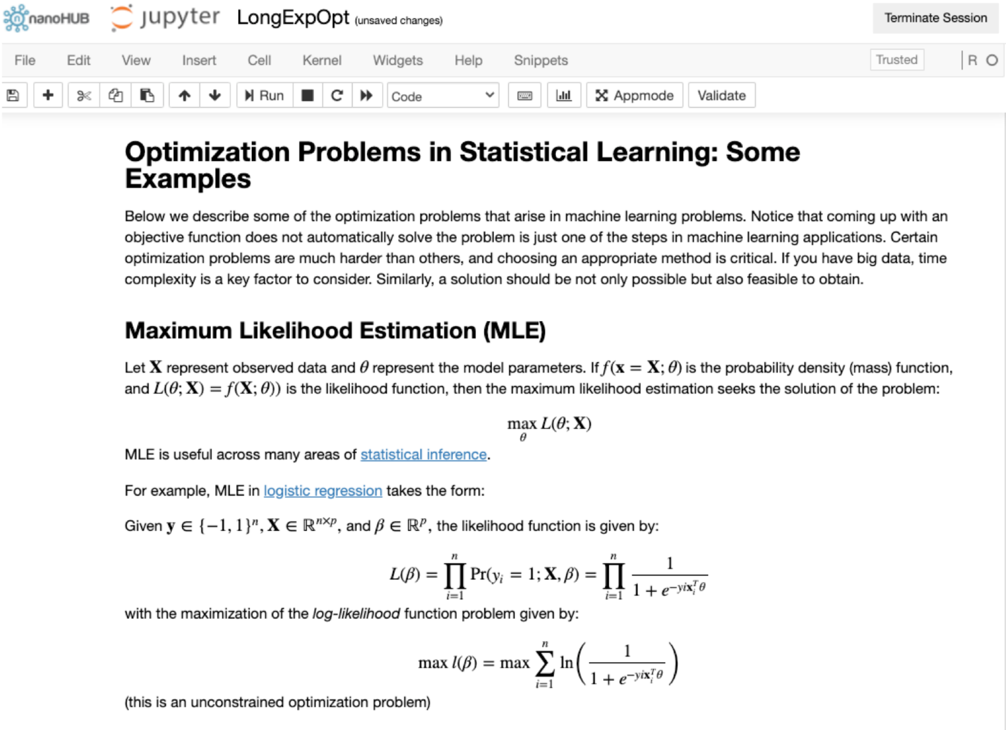
```
Package                            Version
---------------------------------- --------------------
absl-py                            0.7.1
aflow                              0.0.10
aiohttp                            3.5.4
alabaster                          0.7.12
alembic                            1.0.11
amqp                               2.4.2
anaconda-client                    1.7.2
anaconda-navigator                 1.9.6
anaconda-project                   0.8.2
ann-visualizer                     2.5
ansiwrap                           0.8.4
antimony                           2.11.0
appdirs                            1.4.3
appmode                            0.5.0
argh                               0.26.2
arrow                              0.13.1
ase                                3.17.0
asn1crypto                         0.24.0
```

In [ ]:

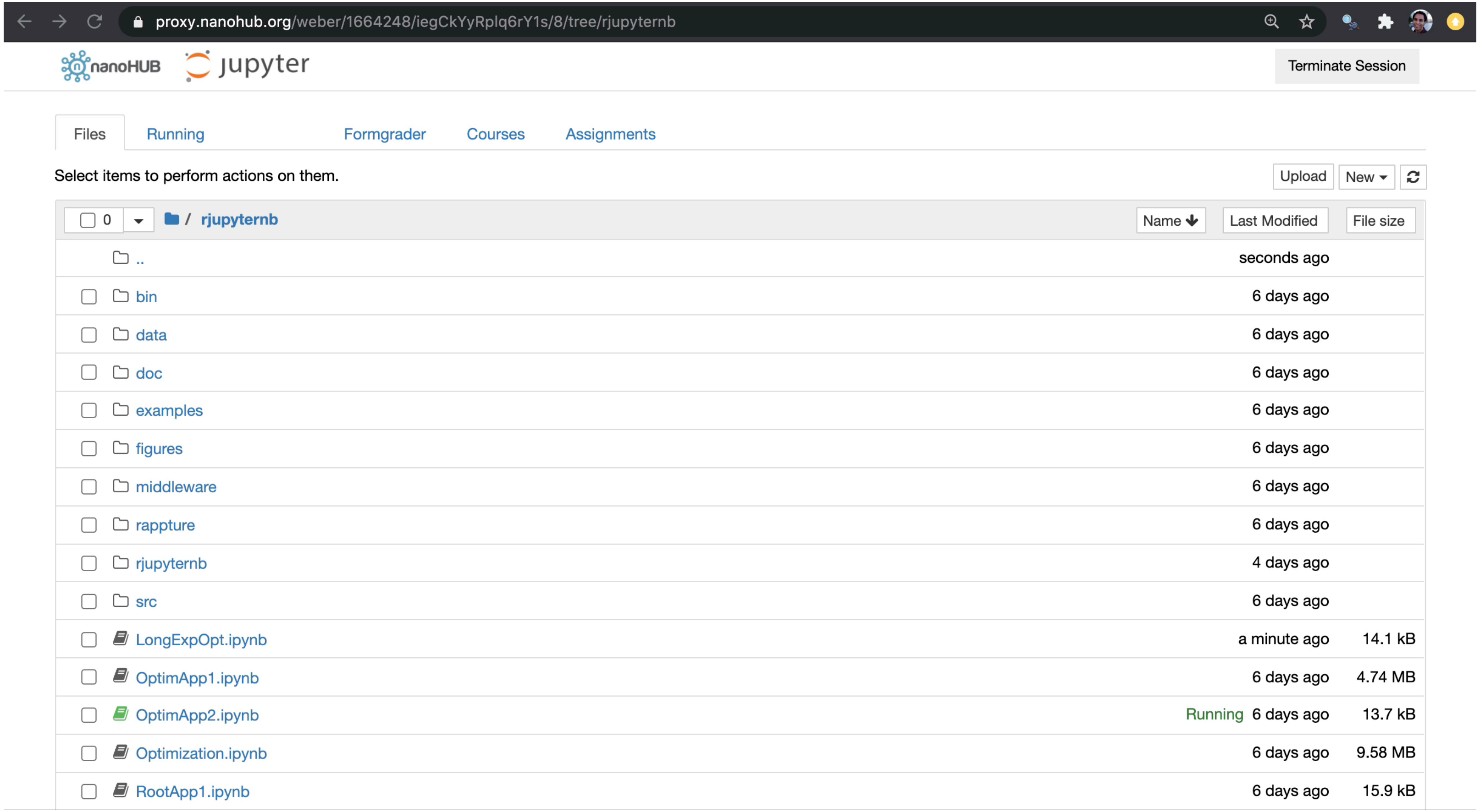
Markdown

(new to markdown? Visit https://commonmark.org/help/tutorial/)





Data in one place



Some ideas for using nanoHUB in your course

Provide your students with ***templates*** (.ipynb) for class demos/HW

You could create a ***group*** in nanoHUB for your course: forum, announcements, wiki page, and easy file sharing

Share/Develop a ***tool*** with/for your students to explore topics of your course and test different implementations

- Super helpful *Support Team*: contact them if your tool requires a special (or a particular version) library/package

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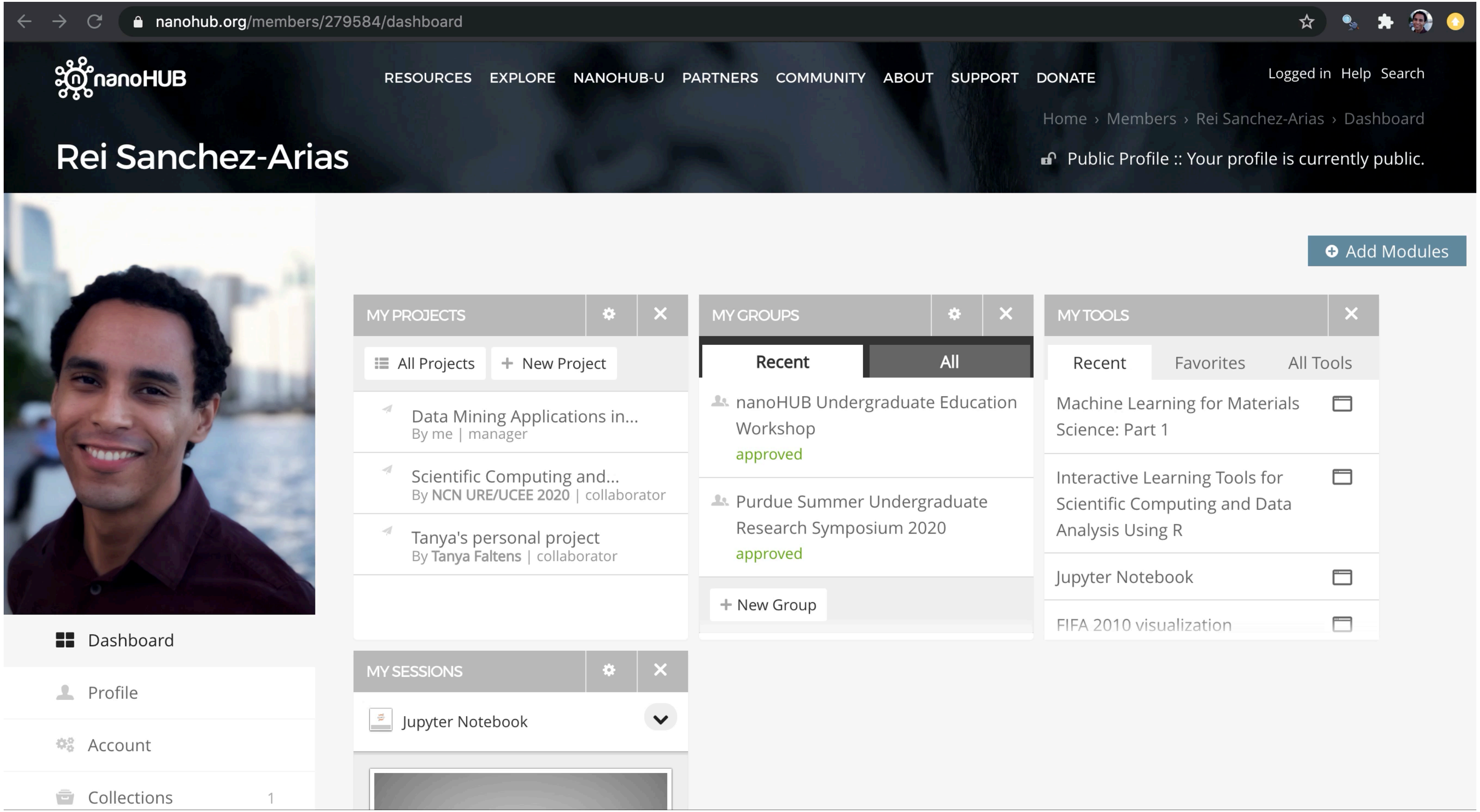
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MY PROJECTS
All Projects
New Project
Data Mining Applications in...
By me | manager
Scientific Computing and...
By NCN URE/UCEE 2020 | collaborator
Tanya's personal project
By Tanya Faltens | collaborator
MY GROUPS
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approved
Purdue Summer Undergraduate Research Symposium 2020
approved
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Recent
Favorites
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