ROBERT DZUDZAR

@ robertdzudzar@gmail.com in https://www.linkedin.com/in/robertdzudzar/ github.com/rdzudzar

EDUCATION

PhD Candidate in Astrophysics

Swinburne University

October 2016 – current Melbourne, Australia

- My PhD research is a detail study of galaxy evolution in a group environment using observations and simulations.

MSc in Astrophysics

Astromundus

October 2014 – September 2016 Austria & Italy

- My MSc project was a spectroscopic study of dwarf galaxies.

BSc in Physics

University of Novi Sad

October 2008 – September 2014 Serbia

PROGRAMMING PROJECTS

Self-motivated & Contributed

Interactive exploration of multiple data-sets

- I developed a **python** script in **jupyter notebook** for an interactive exploration of multi-wavelength data-sets, published at `https://datalab.noao.edu`; the script is also available on my *github*.
  In summary: The survey catalogue is used to create a sub-sample of desired galaxies, using **pandas & beautiful soup**. For the obtained sample, two separate databases are queried: a) to get spectra and b) to get the optical images. As a final product, two data-sets are joined together, visualised and interactively explored using **bokeh**.

Screenplay analysis: text processing, analysis and interactive exploration

- Using **python**, I performed a detailed analysis and interactive exploration of the TV show “Friends" screenplay; the code is available on my *github*.
  In summary: Loading raw screenplay from HTML to text and performing **text processing** to extract lines of each character per episode and per season. Generating various wordclouds, searching for phrases, analysing word counts and number of lines. Furthermore, one of the final products is interactive exploration of the data-set with **bokeh**.

Bokeh Server App: Exploration of the simulated Universe

- My ongoing project is creation of an interactive exploration of the simulated Universe.
  In summary: Project is aimed to introduce a user to data obtained from simulations, in particular those available at Theoretical Astrophysical Observatory: `tao.asvo.org.au/tao/`. Using a Bokeh server, a user will be able to explore desired properties obtained from simulation through interactive exploration and visualisation.

PROGRAMMING & TOOLS

Python: Intermediary

R: Beginner

Tools : Tableau, MIRIAD, CASA, IRAF, LaTeX, *github*

OzSTAR : Some experience with using supercomputer (*sbatch*)

LANGUAGES

English
Serbian
Rusyn
Spanish

INTERESTS

- Data Exploration
- Visualisation
- Astrophysics
- Outreach
- Teaching

STRENGTHS

Data Visualisation | Research | Communication skills | Organisation | Presentation | Team player & Leader

ACTIVITIES

Datathon

Melbourne

2019

- Participation at Melbourne Business Analytic Datathon: analysis and visualisation of sports data (AFL).

ADACs

Sydney

2020

- Participant at the Astronomy Data and Compute Services (ADACs) astro-computational hack week: gave a flash talk talking about interactive visualisation.

PHD RESEARCH PROJECTS

Programming and Tools

2016-current

- During my PhD candidature I gained experience with data acquisition, reduction and analysis. Exploration of the radio interferometric data was performed with astronomical software, such as MIRIAD, CASA, KVIS, IRAF, SAODS9 and Origin. The majority of the data is 3 dimensional, and the final data products are data-cubes in FITS file format.

  I performed various measurements and analysis within **Python**. Most frequently used libraries being: **Astropy, Matplotlib, NumPy, Pandas, APLpy, Bokeh, SciPy and Seaborn.**
  Other libraries: ChainConsumer, H5py, mpi4py

Telescope time allocation

2016-2019

- I had successful research proposals for time on telescopes. As a **leader** I obtained time on the Australia Telescope Compact Array (ATCA, Australia), Nobeyama 45m (Japan) and Siding Spring 2.3m telescope (Australia).
  My responsibility: Leading scientific projects, writing scientific research idea, using telescopes to obtain data, performing data analysis and publishing results in an international peer-reviewed scientific journal.
- I was a collaborator on a successful projects for time on ATCA and ALMA telescope.
  My responsibility: Preparing telescope files, assisting in data acquisition and analysis.

PUBLICATIONS

- Džudžar, R. et al. (2019). The neutral hydrogen properties of galaxies in gas-rich groups. MNRAS, 483:5409–5425
- Džudžar, R. et al. (2019b). Group pre-processing versus cluster ram-pressure stripping: the case of ESO156-G029. MNRAS, 490(1):L6–L11
- Murugeshan, C. et al. .... Džudžar, R. (2018). Angular momentum regulates HI gas content and HI central hole size in the discs of spirals. MNRAS, 483.2398M
- Li, J. et al. ... Džudžar, R. (2020). Angular momentum-related probe of cold gas deficiencies. MNRAS.tmp..487L
- Džudžar, R. et al. (submitted). Environmental processing of galaxies in HI-rich groups
- Džudžar, R. et al. (in preparation). Gas-rich haloes and their formation in the Dark Sage semi-analytic model

ACTIVITIES

Teaching Experience

Swinburne University; Melbourne

2017 – 2019

Teaching Assistant for Bachelor courses:

- **eScience** – Teaching introduction to R and data science.
- **Discovering the Universe** – Teaching introduction to Astrophysics.
- **Electronics** – Lab technician.

Completed online Courses

- 2013: Computing for Data Analysis.
- 2019: Introduction to Data Science in Python
- 2019: Applied Plotting, Charting & Data Representation in Python
- 2020: Applied Machine Learning in Python
- 2019: Fundamentals of Visualization With Tableau
- 2020: Essential Design Principles for Tableau
- Ongoing: Vizualization with Tableau

Service work

Swinburne University; Melbourne

2018 – 2019

- Student representative on a Keck Telescope Allocation Committee. I was one of six members, evaluating research proposals for the Keck Telescope.

Awards

Scholarships

- Category A scholarship in Erasmus Mundus Masters program **Astromundus** (2014 – 2016)
- Swinburne University Postgraduate Research Award (2016 – current)