**Analysis of Microscopic Data**

**Abstract**

# Introduction[1000-1500 words]

1. **Literature Survey Detail every paper in a paragraph**

Paper (1) presents ZeroCostDL4Mic, a platform democratizing DL for microscopy by lever- aging Google Colab’s free resources, allowing researchers without coding expertise to perform various DL tasks. The platform ensures reproducibility through detailed training reports and supports tasks, for example, segmentation, object detection, and denoising. ZeroCostDL4Mic is user-friendly, covering end-to-end workflow, and adaptable to other Jupyter Notebook plat- forms.

Pape

# References

1. Lucas Chamier, Romain Laine, Johanna Jukkala, Christoph Spahn, Daniel Krentzel, Elias Nehme, Martina Lerche, Sara Hernández Pérez, Pieta Mattila, Eleni Karinou, Séamus Holden, Ahmet Solak, Alexander Krull, Tim-Oliver Buchholz, Martin Jones, Loic Royer, Christophe Leterrier, Yoav Shechtman, Florian Jug, and Ricardo Henriques. Democratis- ing deep learning for microscopy with ZeroCostDL4Mic. *Nature Communications*, 12, 04 2021. DOI:10.1038/s41467-021-22518-0
2. Alexander Krull, Tim-Oliver Buchholz, and Florian Jug. Noise2Void - Learning Denoising From Single Noisy Images. pages 2124–2132, 06 2019. DOI:10.1109/CVPR.2019.00223
3. Y Zha, H Chong, and H Qiu. Ontology-aware deep learning enables ultrafast and inter- pretable source tracking among sub-million microbial community samples from hundreds of niches. *Genome Med*, 14:43–43, 2022.

Literature Survey Table

Ref. No

(1)

Objective

Problem Statement

Methodology

Advantages

Disadvantages

Performance

Measure

Democratize

microscopy

Addresses the chal- lenge of democratiz-

ing access to deep

DL

via by

access

ZeroCostDL4Mic

offering

free

learning

(DL)

for

over-

to

high-performance

microscopy, coming the

of requiring

computing

resources

barrier

power-

and simplifying DL for

non-coders

ful

computational

resources and coding expertise for training DL networks in image

analysis tasks

(2)

(3)

Noise2Void

Ontology microcommu- nity

(4)

1. M Maška, V Ulman, and P Delgado-Rodriguez. The Cell Tracking Challenge: 10 years of objective benchmarking. *Nat Methods*, 20:1010–1020, 2023.