# Bioinformatics in action: Current Techniques and Tools Used in Our Lab

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February 14, 2024

Introduction

- Coined in 1970 by Paulien Hogeweg and Ben Hesper

- Utilization of computational tools and analytical methods for capturing and interpreting biological data

- Biological data (genomics, transcriptomics, proteomics and metabolomics)

- Plays a crucial role in modern biology and medicine, facilitating the understanding of complex biological processes
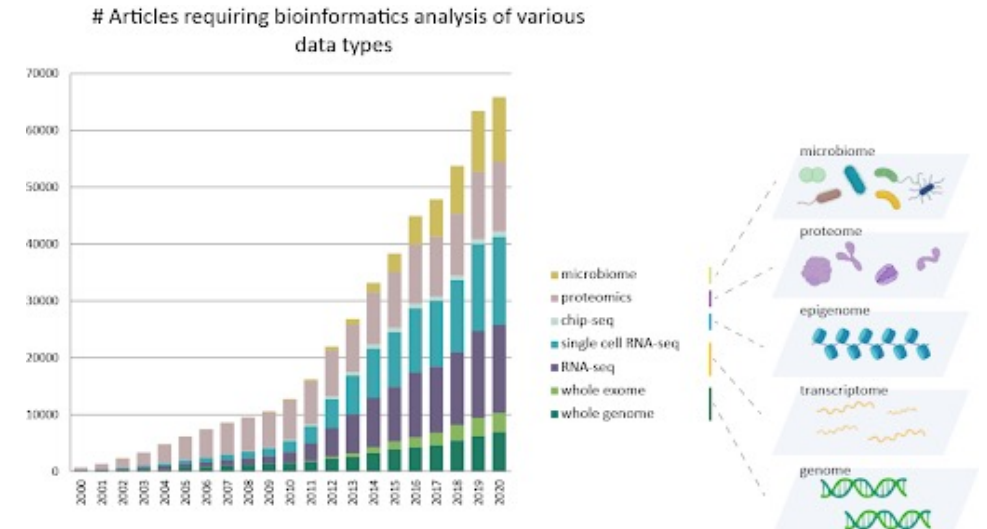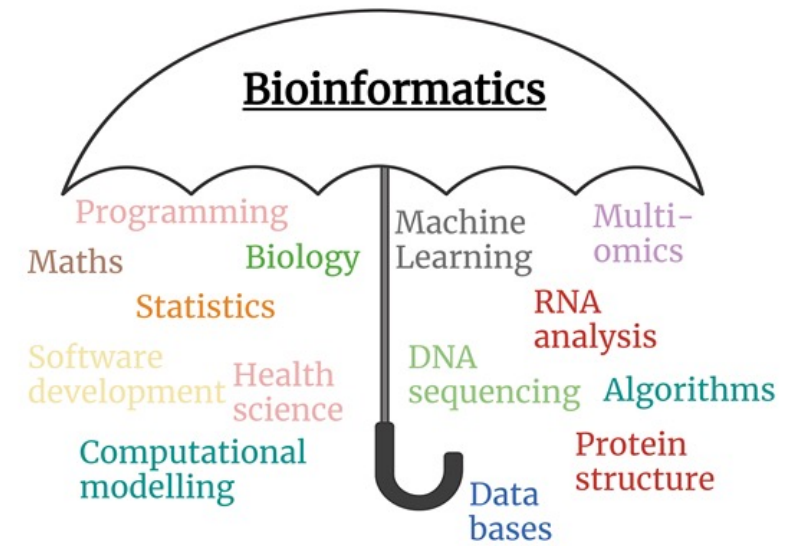
Bioinformatics role during the pandemic

- Rapid Genome Sequencing and Analysis
- Tracking Virus Evolution and Spread
- Vaccine Development
- Therapeutic Targets
- Understanding Host Response
- Public Health and Epidemiological Studies

Bioinformatics tools gained popularity during the pandemic

- Pangolin (Phylogenetic Assignment of Named Global Outbreak Lineages)
- ARTIC network
- Nextstrain
- GISAID (Global Initiative on Sharing Avian Influenza Data)
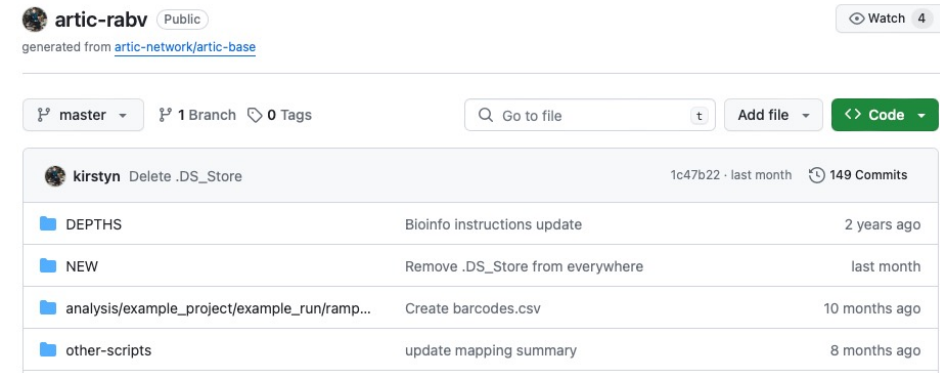- Bioconductor and COVID-19 Data Portal
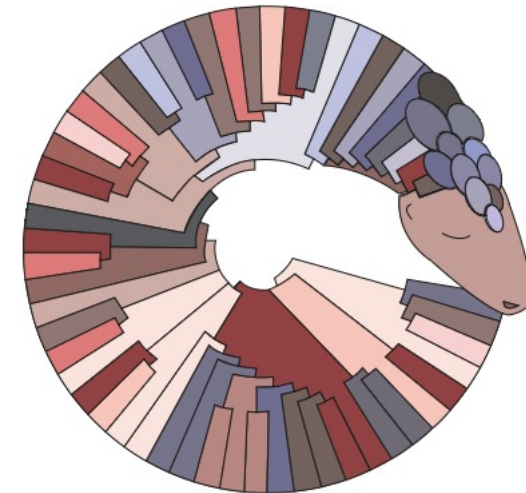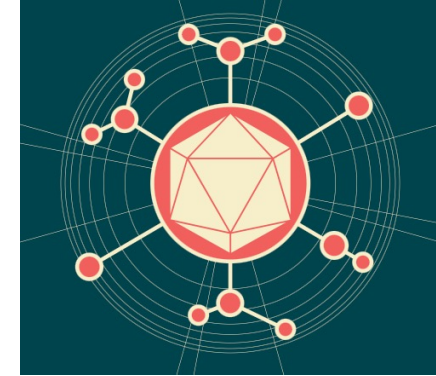
Computation facility at UofG

- Alpha2
  - RAM: 4TB
  - Processing cores: ~250
  - GPU's: 4 x 32 GB

- HPC cluster
  - RAM: 300GB
  - Processor: ~100
  - GPU's: 2 x 32 GB

- MARS
  - RAM: 2TB
  - Processing cores: ~200
  - GPU's: ~120 GB

Current bioinformatics practice

- Shell/Python/R
- Pipelines (Snakemake)
- Web-based resources

Current challenges at our lab

- Tools and the complexities (execution, parameters)
- Internet issues at field work (remote location)
- Intermediate/advanced bioinformatics skills
- Hardware facilities to run massive informatics

Future implementation

- AWS implementation
- Pipeline developments
- GUI's to develop and support cross platform

Thank you

Reference to images

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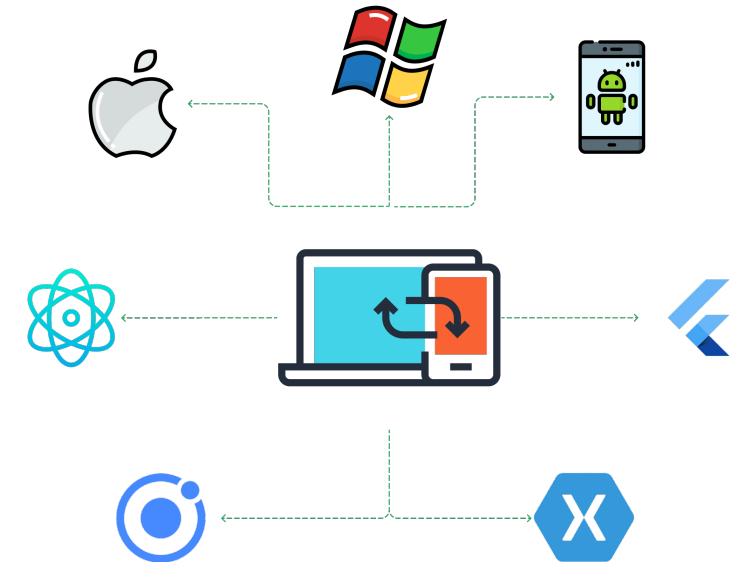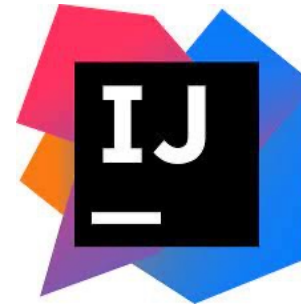- https://www.google.com/imgres?imgurl=https%3A%2F%2Fupload.wikimedia.org%2Fwikipedia%2Fcommons%2F9%2F93%2FAmazon_Web_Services_Logo.svg&tbnid=FB3B89WhUh9TUM&vet=12ahUKEwij262GhoWEAxXTUaQEHe1SCeQQMygAegQIARB0..i&imgrefurl=https%3A%2F%2Fen.wikipedia.org%2Fwiki%2FAmazon_Web_Services&docid=JSgXJbxN-7t0-M&w=800&h=479&q=aws&client=safari&ved=2ahUKEwij262GhoWEAxXTUaQEHe1SCeQQMygAegQIARB0

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