



University
of Glasgow

Evolving Neural Networks for Optimal Service Function Chain Embedding

Lightning Talk, SICSA PhD Conference 2026

Glasgow Caledonian University



Theviyanthan (Thivi)
Krishnamohan

hello@thivi.dev

School of Computing Science,
University of Glasgow

Hello World! 🖐️

I am a third-year Ph.D. student, researching
Genetic Algorithms for autonomous networks at
the University of Glasgow.

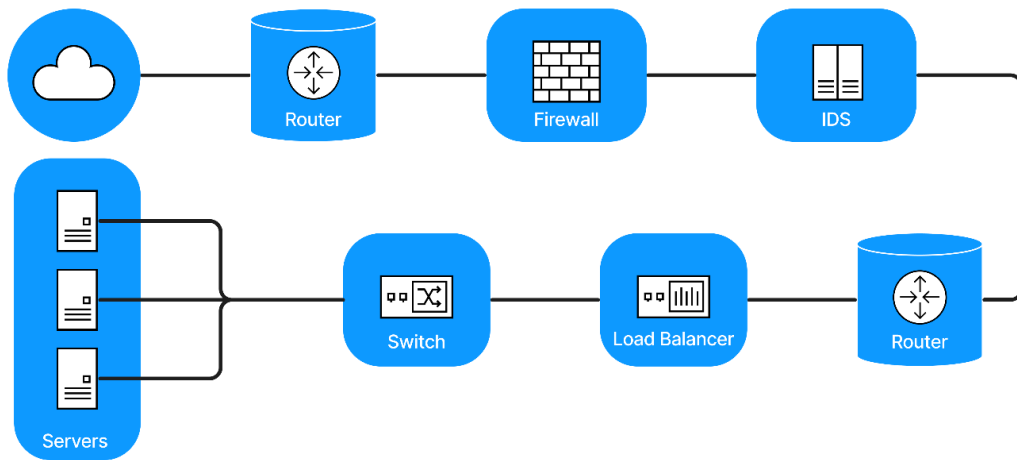


www.thivi.dev

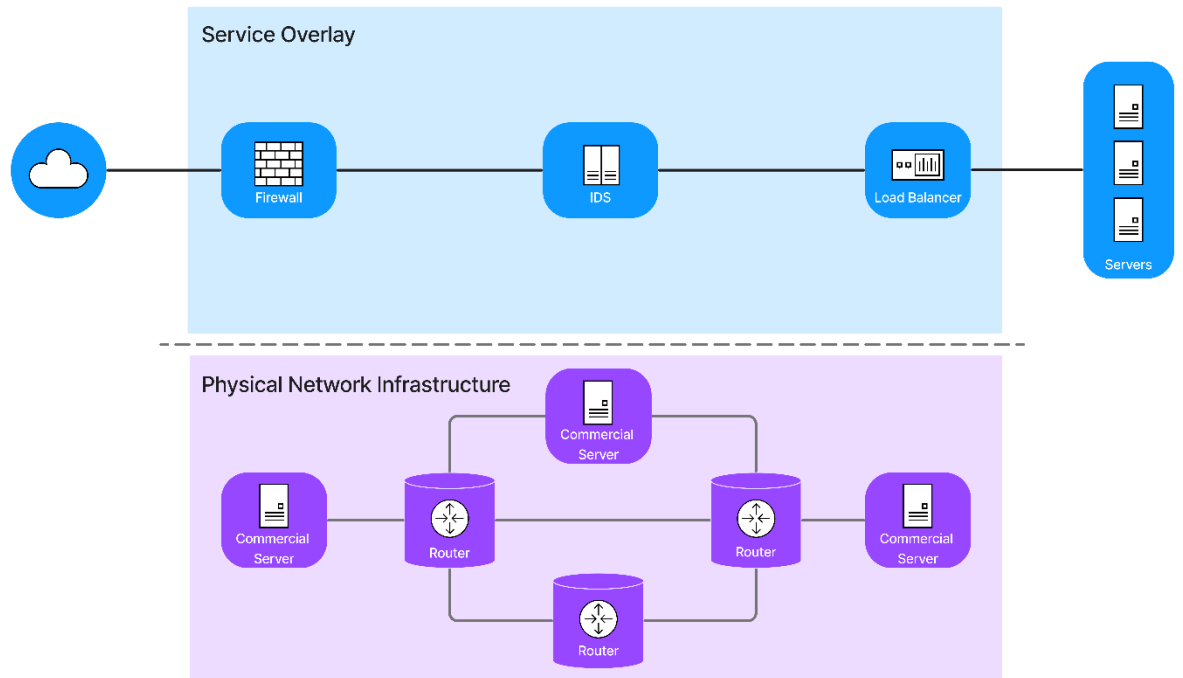
Service Function Chains (SFCs)

- SFCs combine Network Function Virtualisation and Software-Defined Networking to create a service overlay over the physical network.

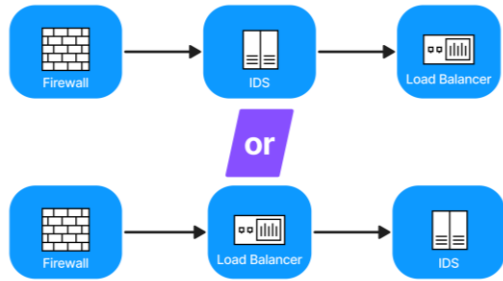
A traditional network:



A Service Function Chain:



SFC Optimal Composition and Embedding (SFC-OCE)



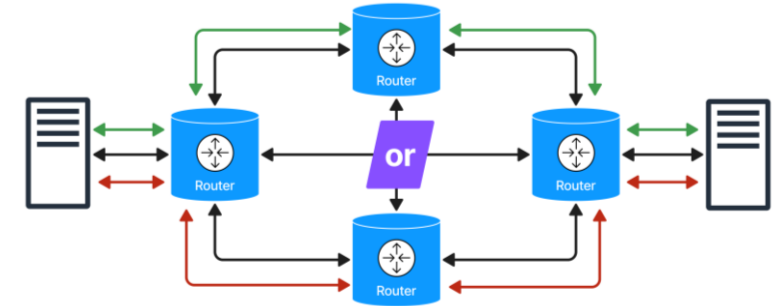
1. Chain composition

How should the Virtual Network Functions (VNFs) be ordered for optimal performance?



2. VNF embedding

Where should the VNFs be deployed for optimal performance?



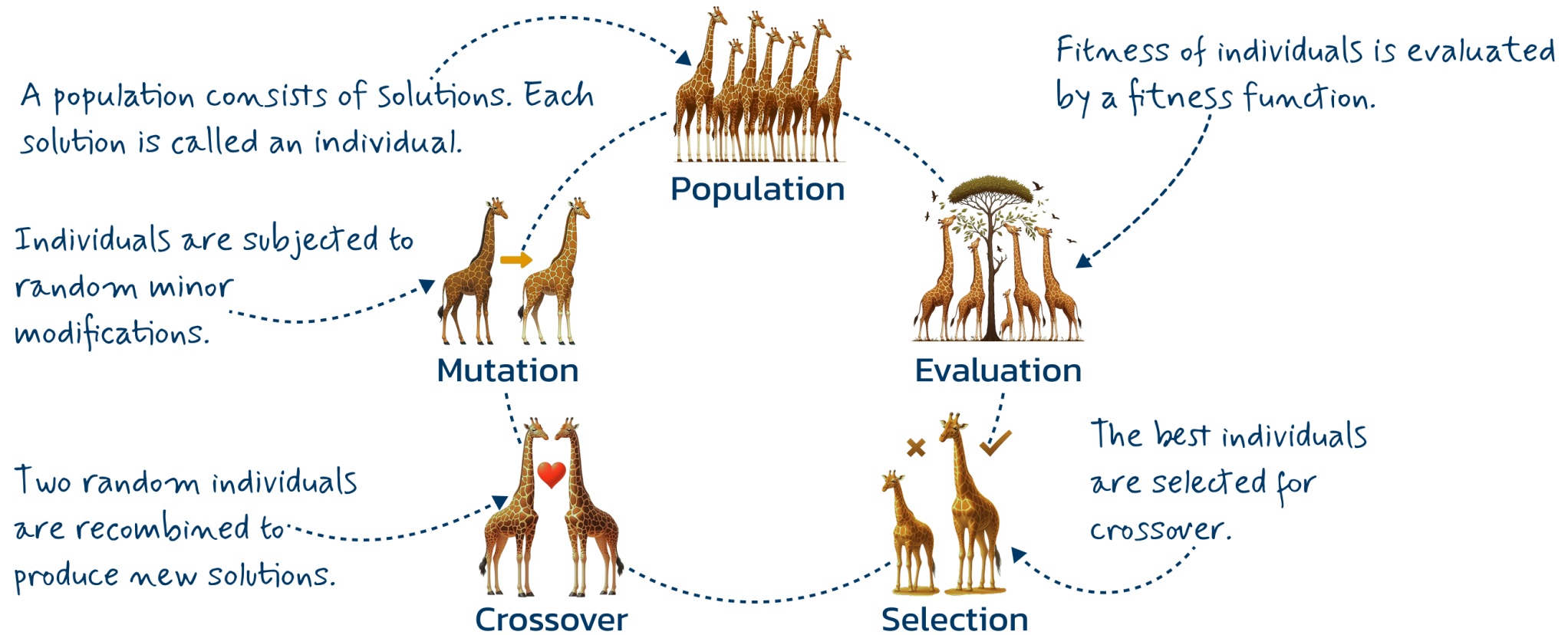
3. Virtual Link embedding

How should the VNFs be linked for optimal performance?

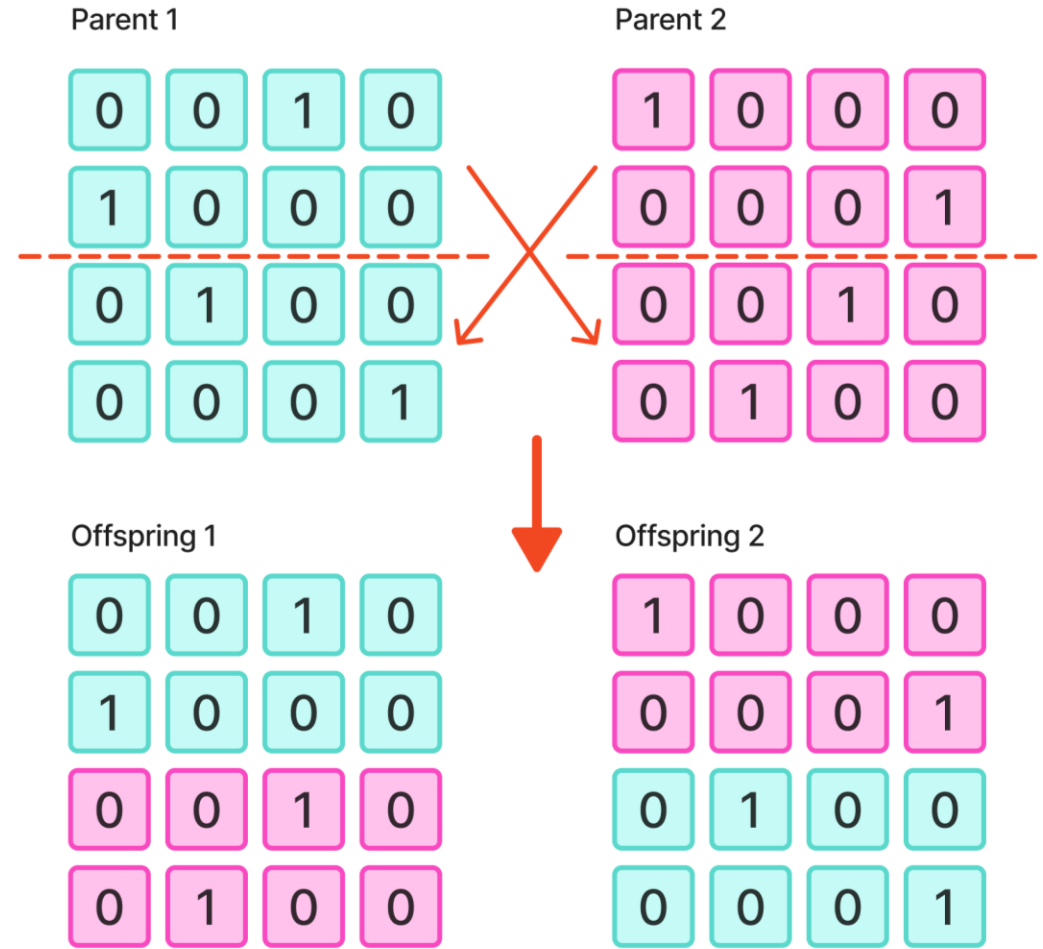
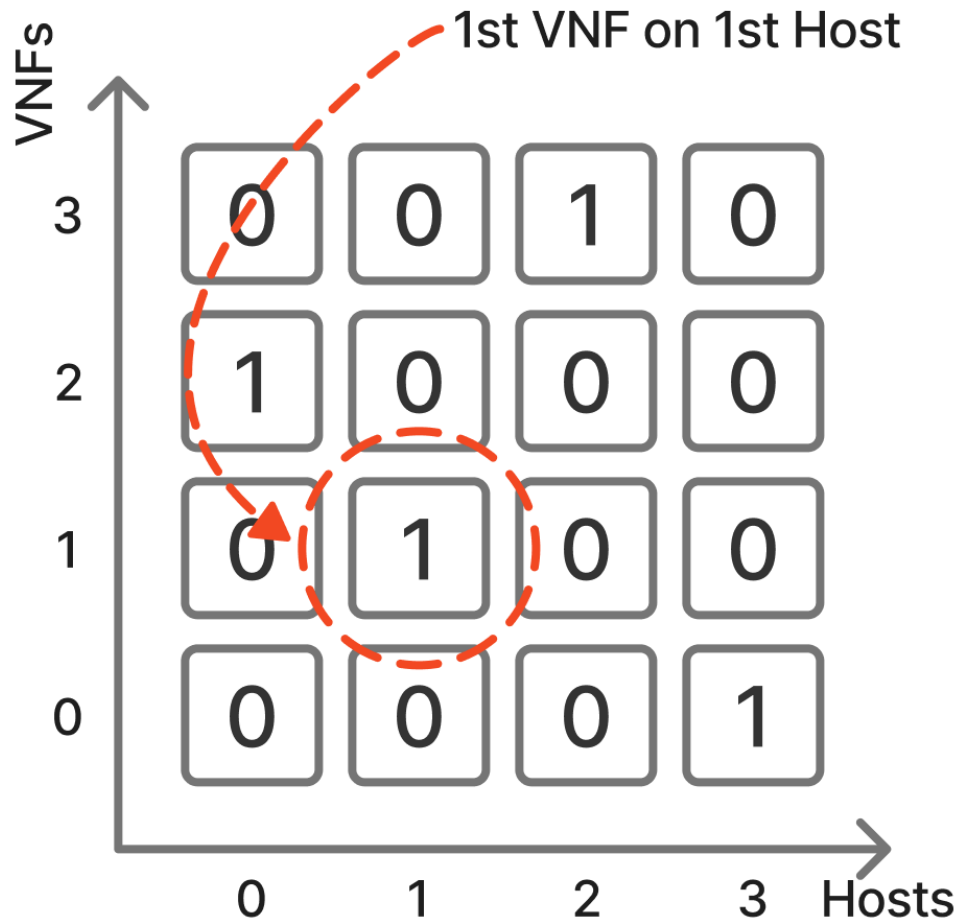
- All three have to be optimised simultaneously to produce an optimal embedding, and this is an **NP-hard** optimisation problem [1].

[1] J. Gil Herrera and J. F. Botero, "Resource Allocation in NFV: A Comprehensive Survey," in IEEE Transactions on Network and Service Management, vol. 13, no. 3, pp. 518-532, Sept. 2016, doi: 10.1109/TNSM.2016.2598420.

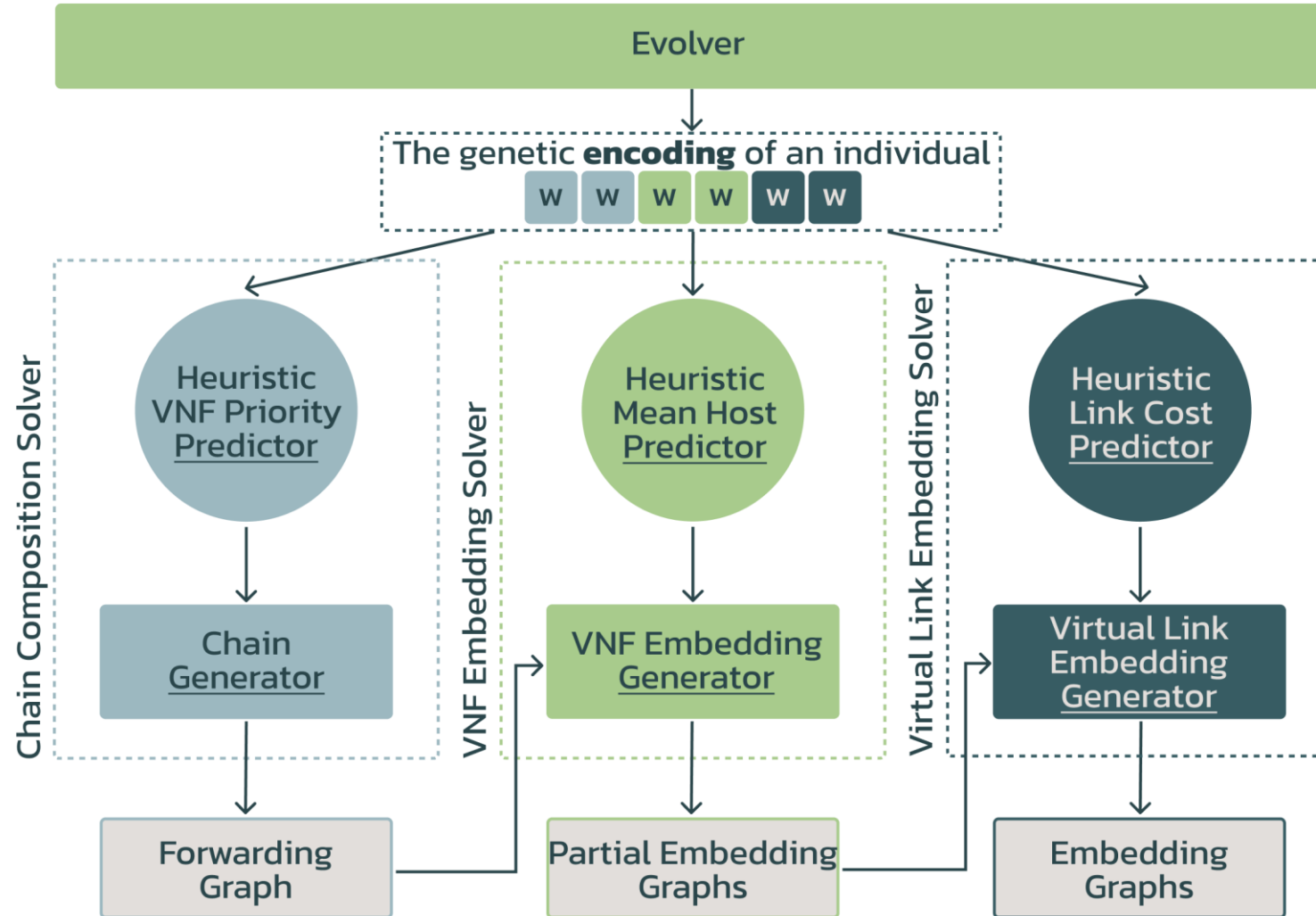
Genetic Algorithm



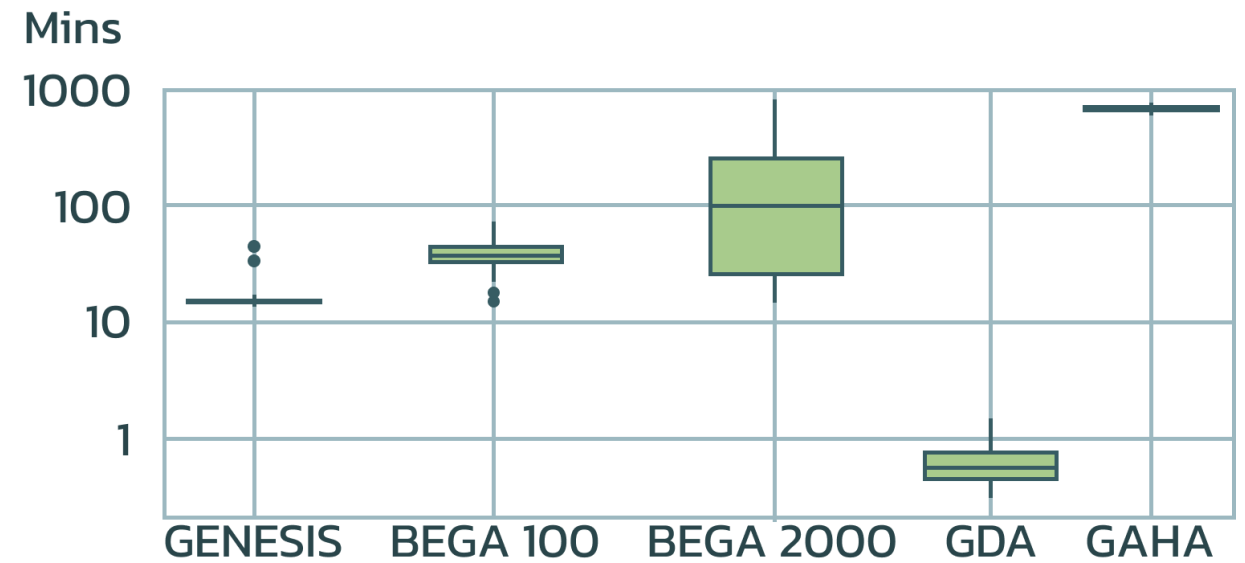
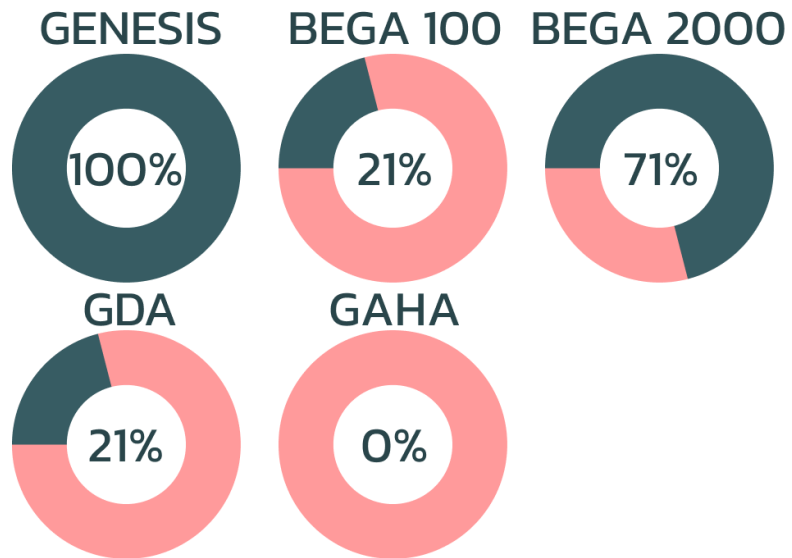
Typical Genetic Encoding



GENESIS



Results



Questions

Thank You