State of the art opposes two networking paradigms, swapping each other’s strengths and weaknesses.

Centralizing routing decisions
✓ Flexibility
   Can use any path
✓ Manageability
   Single point of control for operators

Using distributed routing protocols
✓ Resiliency
   React quickly to any set of failures
✓ Scalability
   Work in very large networks

We propose an architecture \[1\] combining these advantages.

The controller can enforce any forwarding DAG on a per-destination basis, supporting various use-cases.
- Traffic steering
  Enforce middlebox traversal
- Equal-cost path addition/removal
  Provide fine-grained control over ECMP
- Backup path provisioning
  Prevent post-failure issues

This architecture can be further explored.
- We can control today’s OSPF routers
  What are the minimal requirements to control any link-state IGP?
- We fully control the paths and costs
  How can we control other protocols using the IGP?
- We modelize the routers to decide what control-plane message to send
  How can we verify the network behavior?

[1] Stefano Vissicchio, Olivier Tilmans, Laurent Vanbever, and Jennifer Rexford.