**Algorithm 1 Determine Optimal Paths for fault tolerant scheme**

1. **Input:** G (N, E), A set of network requests R = {Ri| i = 1, 2, 3, 4, .., i}, Ri = {fk1, .., fkm}, AUTO\_FAIL = [5, 6, 13, 19]
2. **Output:** Optimal SFC embedding route vector, **V**
3. /\* Iterate and process all batch requests \*/
4. **for** (each r∈ R) **do /\*** for each incoming request \*/
5. /\* Initialize tracking variables for requests \*/
6. X = 0 /\* Total delay for given request (processing, propagation) \*/
7. Y = 0 /\* Total cost for given request (node, link) \*/
8. Z = 0 /\* Total failure calculation for given request (node, link) \*/
9. K = [] /\* Find shortest path \*/
10. **for** (each possible\_path ∈ R ) **do**
11. /\* Compute all possible paths from source to destination for given request \*/
12. route = possible\_path
13. request\_object = [source, destination, route, funcs, X, Y, Z]
14. else if (hi meets scheme criteria):
15. Add H to O /\* Add path to optimal path list \*/
16. /\* Map routes and functions to graph \*\
17. For (n in G):
18. Update node resources
19. End for loop
20. For (e in G):
21. Update link resources
22. End for loop