**Generalized Planning with Deep Reinforcement Learning**

Or Rivlin, Erez Karpas and Tamir Hazan  
[srivlin@campus., karpase@, tamir.hazan@]technion.ac.il

---

**Generalized Planning**

- Generalized planning aims at finding plans that work for many problems.
- We researched learning policies that generalize very well, acting as approximate generalized plans.

**State Representation**

- We represent states and goals as a graph, with nodes, edges and global features.
- The graph is complete, and structure is encoded through the features.
- State features are concatenated to goal features.

---

**Policy Representation**

- Our policy is composed of two modules: a graph embedding module and an action module.
- The graph embedding module is a graph neural network (GNN) which performs message passing between the graph nodes.
- Embedded elements are clustered by their type and concatenated with an indicator vector.
- Finally the effect vectors are scattered back to their actions and aggregated to form action embeddings.

---

**Tree Search Algorithm**

- We use GBFS with a full policy rollout at each expanded leaf.
- Only the first state-action of the rollout is added to the open list.

---

**Experimental Results**

- Test success rate against number of expanded states.