“Domain-independent” planning and “Domain-dependent” planning

Le Meilleur est l’ennemi du bien.
The Best is the enemy of the good.
Voltaire

Thanks to Dana Nau....
Domain dependent planners?

- For many applications, domain dependent techniques are still critical
  - Exploit domain features for efficiency
  - Avoid the limitations of PDDL
  - Control the types of plan output
- Planning is at least partly an engineering discipline, and domain-independent planning isn’t (yet) the best solution for most domains
- Some examples
  - NASA Europa and Aspen applications
  - Uninhabited Air Vehicles
  - Amada sheet metal bending
  - Bridge Baron
Domain dependent planners?

- Many “domain dependent planners” aren’t TLPlan, TALplan
- SHOP2
- Europa
- Aspen
- Techniques used in these planners diverge
How do we incorporate domain-dependent techniques?

- We need to be able to study domain-dependent techniques.
- How do we empirically study these planners and their heuristics?
  - Comparison and ablation studies
- A certain amount of apples and oranges comparison is unavoidable.
  - Including comparing these techniques against domain-independent planners.
Why should domain-independent researchers care?

- Performance of domain-dependent techniques provides challenges to improve performance of d-i planners
- Identify semi-specific techniques for classes of problems
  - E.g., heuristics that are useful for domains involving motion in 2-space...
- Provide new challenges for expressive power of PDDL
  - State features, optimization criteria, etc.
PDDL is not a natural phenomenon & the IPC is not an application

- Domain independent planners claim not to use domain knowledge.
- But it takes a great deal of domain knowledge and cleverness about planners to write a good PDDL domain definition.
- We don’t trip over PDDL domains in the wild.
- Many are reverse-engineered from applications.
- The distinction between domain-dependent and independent is fuzzier than one might think…. 