User-guided technique lets a user input an approximate path to seed the sampling-based planner by utilizing a 2D mouse, 6D haptic device, or 5D camera flight with keyboard and mouse
- gives positional input to sampler, which then assigns orientation and corrects invalid configurations

Method: Path Steering

User-Guided Planning has the potential to solve narrow passages because of the combination of a planner's automation with a human's skill at global scene analysis.
- Planners are fast, but usually take the obvious route, which is sometimes detrimental.
- Humans have a natural sense of motion planning
- Combined, both make up for what the other lacks.

Related Work:
Region Steering is a user-guided planning technique where the user specifies a region to the planner and designates it as an avoid, attract or neutral to guide the planner through an optimal or safe path.

Experiments

From our experiments, we can see that the User-Guided Path Steering technique
- Achieves a better result than any automated planner by itself.
- The human component (user) limits the sampling space to the input path.

**NOTE: Only experienced undergraduates participated in Path Steering. We do support PHANTOM® 3D but were unable to test it due to time constraints.**

Conclusion

We have presented a motion planner that combines human input and planner automation to better solve various motion planning problems, including narrow passages.

We have shown that a human’s natural motion planning abilities lead to a drastic improvement in time, reducing planning time to a few seconds, and the average combined time to less than a minute.

Future Work:
We would like to improve our approach of the motion planning problem by
- Allowing the user to input multiple paths
- We would like to compare it with region steering to compare user burden and effectiveness.
- Also we would like to improve our method's robustness to account for inexperienced users.