Docket #: S17-376

Stanford Drone Dataset: Multi-scale, Multi-target social navigation

Stanford researchers have created the first large-scale dataset of aerial videos from multiple classes of targets interacting in complex outdoor spaces. The Stanford Drone Dataset comprises of more than 100 different top-view scenes for a total of 20,000 targets engaged in various types of interactions. Previous datasets included mostly single target but this dataset includes pedestrians, bikers, skaters, cars, and carts, all interacting based on common sense and social etiquette rules. Moreover, the researchers introduced a new characterization that describes the "social sensitivity" at which two targets interact. This feature is used to define "navigation styles" which improve both forecasting models and state-of-the-art multi-target tracking such as those used in computer vision models.

Stanford Drone Dataset

Stage of Research

- Proof-of-concept
- Demonstrated the ability to model the interaction between humans and their surroundings to improve or solve numerous computer vision tasks

Applications

- **Multi-target navigation forecasting training models**
- End user industries include Homeland security, Defense, Autonomous Vehicles, Robotics, Drone navigation, AI with computer vision component

Advantages

- **Time and cost saving**

- **Fully annotated data** – target trajectories along with their target IDs are all annotated
- **First large multitarget data set** – includes 20K targets consisting of 11.2K pedestrians, 6.4K bicyclists, 1.3k cars, 0.3K skateboarders, 0.2K golf carts, and 0.1K buses
- **Based on common sense rules based on social etiquette**
- **Applies new concepts to improve forecasting data:**
    - "social sensitivity" – a feature that analyzes how 2 targets interact (e.g. how much distance a target wants to preserve from other targets)
    - "navigation styles" – assigns values to social sensitivity to determine navigation styles (e.g. the way targets avoid each other)
- **Dataset not reproducible** - because of new drone laws, this type of dataset will no longer be reproducible

Publications

- Robicquet, Alexandre, Alexandre Alahi, Amir Sadeghian, Bryan Anenberg, John Doherty, Eli Wu, and Silvio Savarese. "Forecasting social navigation in crowded complex scenes." *arXiv preprint arXiv:1601.00998* (2016).

Innovators

- Amir Sadeghian
- Silvio Savarese
- Alexandre Alahi
- Alexandre Robicquet

Licensing Contact

Imelda Oropeza

Senior Licensing Manager, Physical Sciences

Email