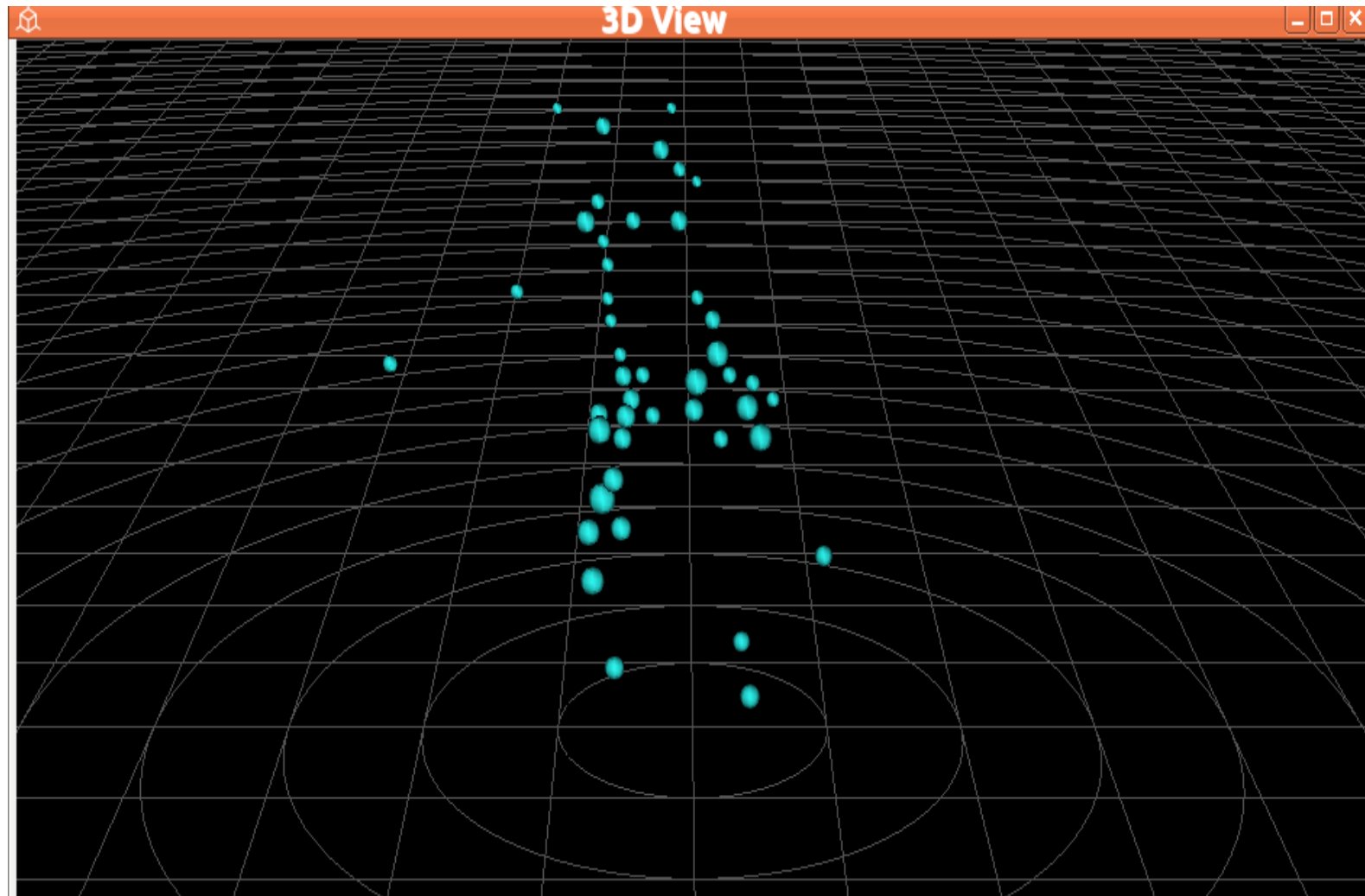# Perception System using Stereo Vision and Radar
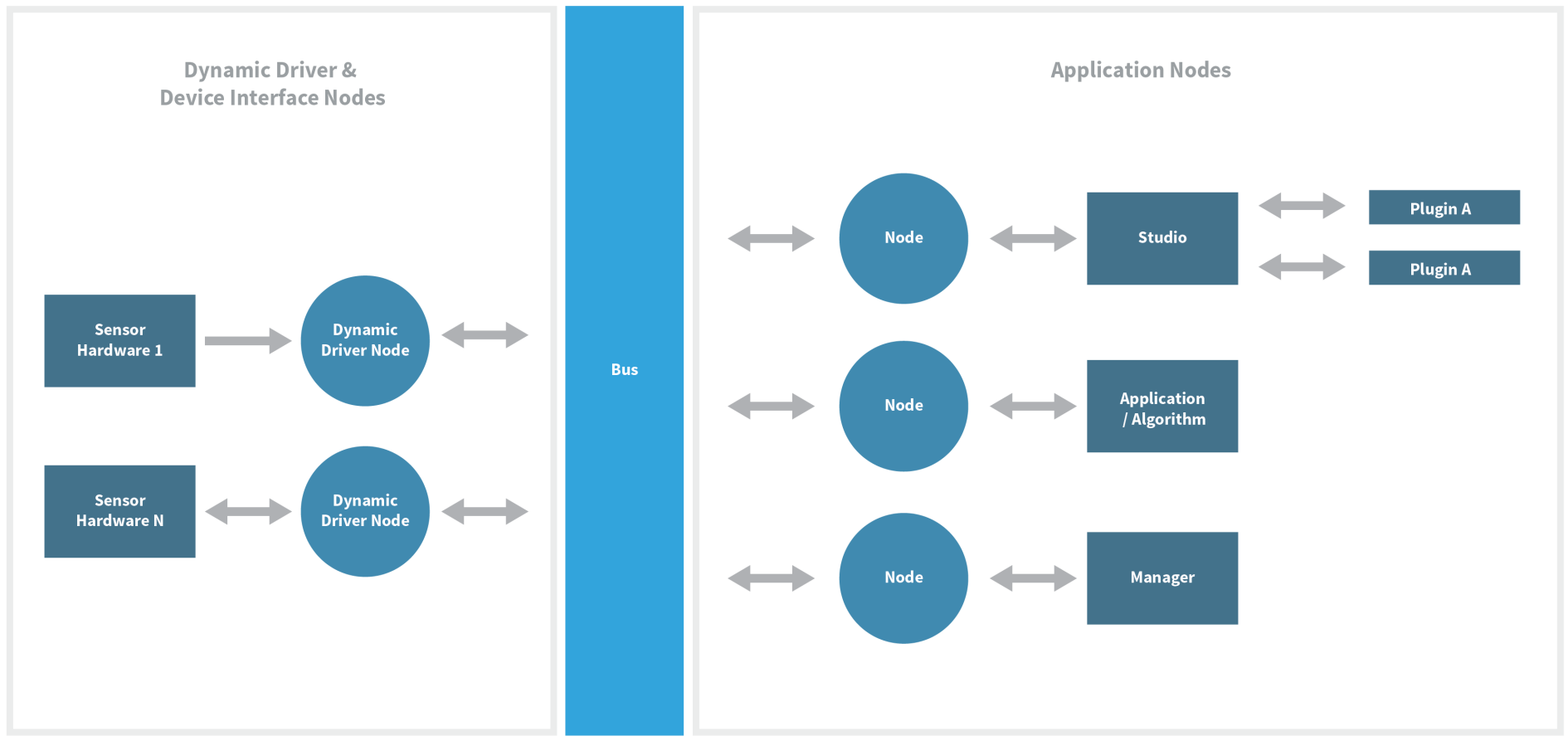
Progress Review 7

Team A
02/ 01/ 2017
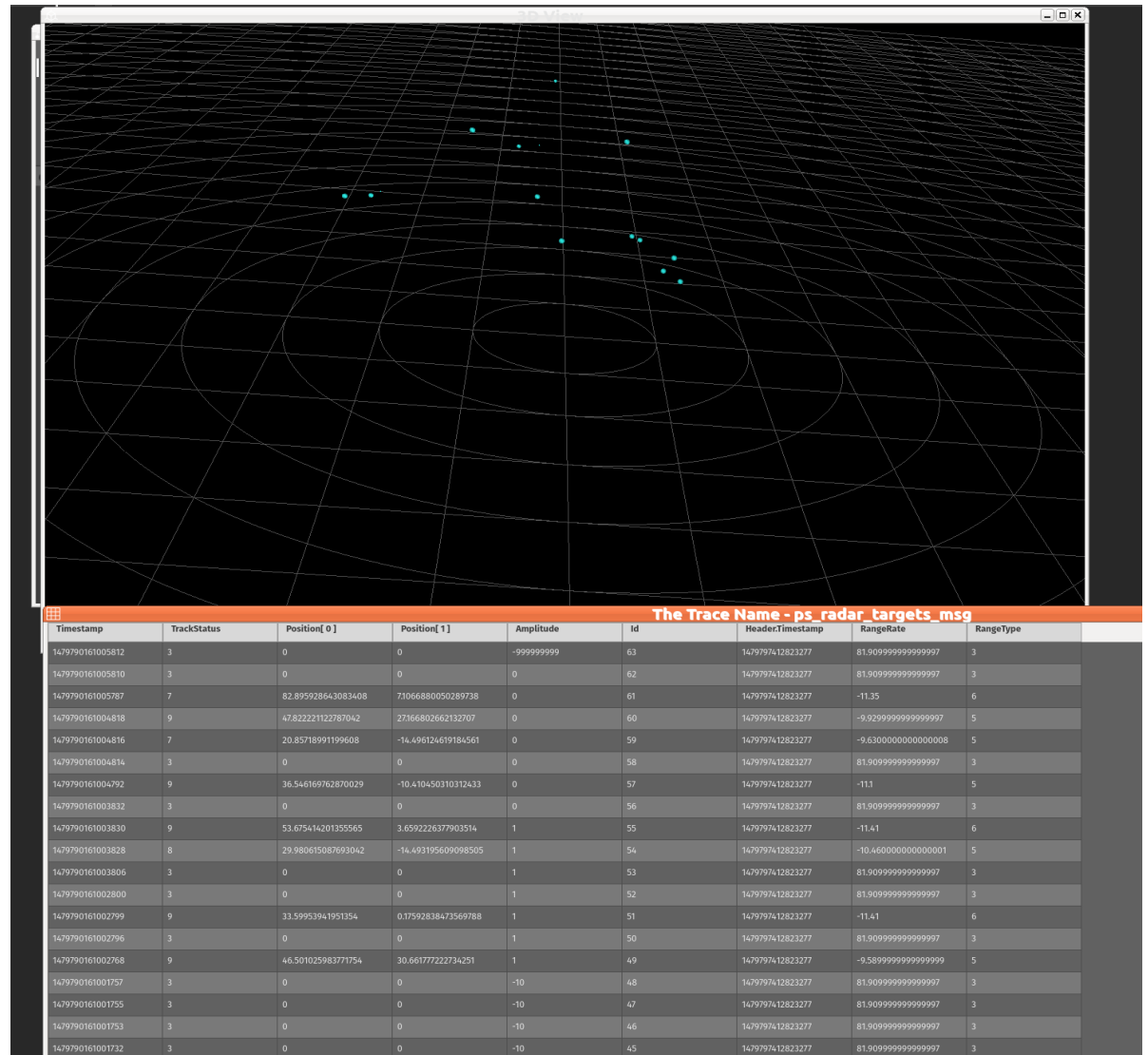
Radar data visualization in PolySync Studio

Full System Architecture

Information Identification

- Target ID
- Time Stamp
- Position
- Velocity
- Range Rate
- Track Status
- Range Type
- Zone Type
- Amplitude
- Magnitude
- Cross Section

Information Extraction

- Filtered by *track status*
- Filtered by *range type*

- *Get track IDs*
- *Get positions*
- *Get velocities*

Value	Description
TRACK_STATUS_INVALID	Track status information is invalid.
TRACK_STATUS_UNKNOWN	Track status information is unknown.
TRACK_STATUS_NOT_AVAILABLE	Status information on the track is not available.
TRACK_STATUS_NO_TRACK	Track is not valid and should not be considered usable.
TRACK_STATUS_RAW_TARGET	Track is a raw target measurement and is not tracked.
TRACK_STATUS_ACTIVE	Track is active/valid.
TRACK_STATUS_CIPV	Track is flagged as the closest in path vehicle.
TRACK_STATUS_NEW	Track is new to the tracker, i.e. the start of a track.
TRACK_STATUS_NEW_UPDATED	Track is new and was updated.
TRACK_STATUS_UPDATED	Track was updated.
TRACK_STATUS_COASTED	Track was coasted.
TRACK_STATUS_MERGED	Track was merged.
TRACK_STATUS_INVALID_COASTED	Track is invalid and was coasted.
TRACK_STATUS_NEW_COASTED	Track is new and was coasted.
TRACK_STATUS_KIND_COUNT	Number of ps_track_status_kind values.

Value	Description
RANGE_INVALID	Range information is invalid.
RANGE_UNKNOWN	Range information is unknown.
RANGE_NOT_AVAILABLE	Range information is not available.
RANGE_NONE	Not in-range.
RANGE_NEAR	Near range.
RANGE_MEDIUM	Medium range.
RANGE_LONG	Long range.
RANGE_KIND_COUNT	Number of ps_range_kind values.

Comparison

Stereo Vision

- Camera calibration using OpenCV
- Result: Errors exist

Future Work Plan

- Cameras
  - Calibrated stereo vision
  - Object depth estimation
- Radar
  - Write data to file
  - More research on filtering techniques