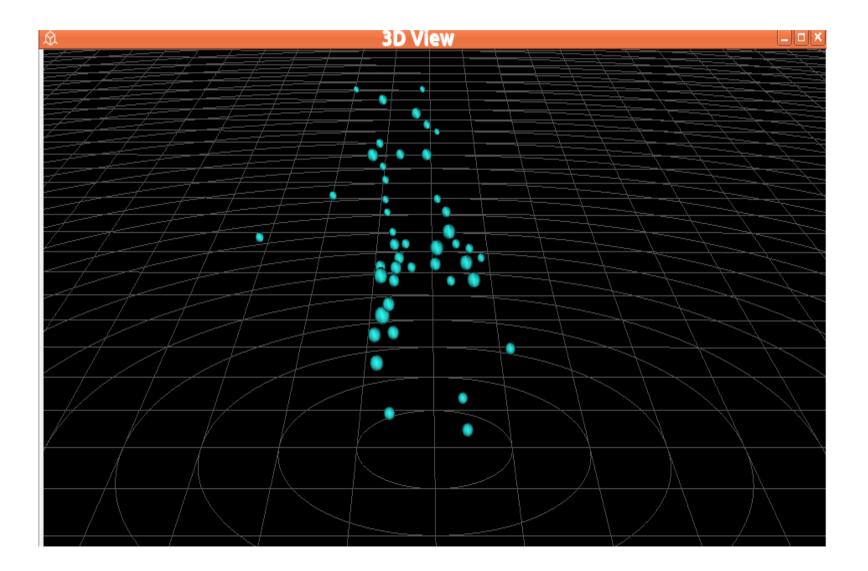
Perception System using Stereo Vision and Radar

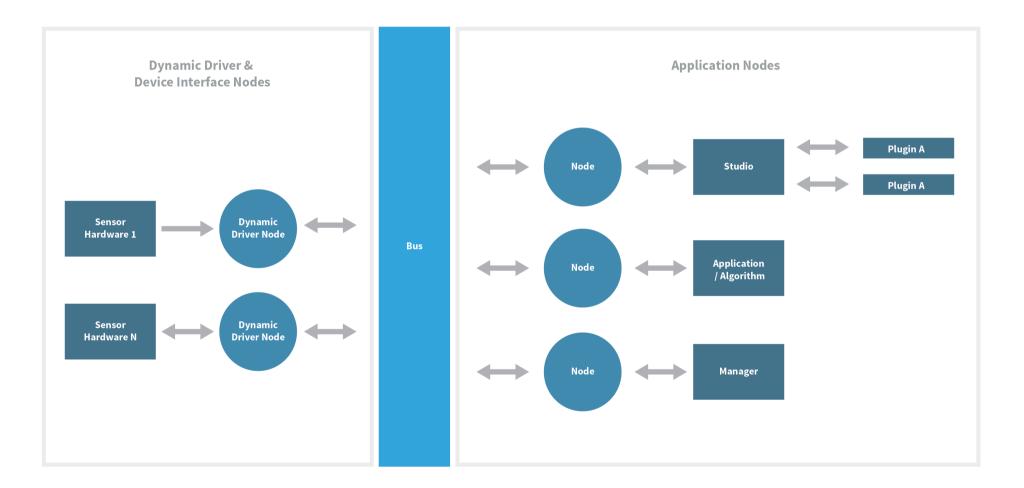
Progress Review 7

Team A 02/ 01/ 2017

Radar data visualization in PolySync Studio



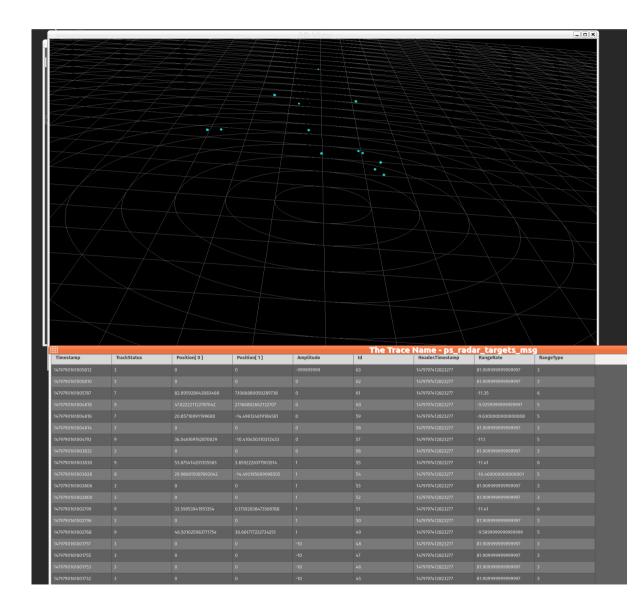
POLYSYNC Full System Architecture



Source: https://help.polysync.io/?p=168

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

				sr/local/polysy				-
): 26	Pos x:			4.12198				
acking	status:	9			_			
): 37	Pos_x:	33.2829	Pos_y:	-2.79484	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 39	Pos_x:	6.89992	Pos_y:	-2.05696	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 48	Pos_x:	32.4982	Pos_y:	0.340333	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 52	Pos_x:	4.67515	Pos_y:	3.08269	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9						
): 63	Pos_x:		Pos_y:	9.97264	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 1	Pos_x:	35.898	Pos_y:	-0.375937	Vel x:	-1e+09	Vel y:	-1e+09
	status:	9			_			
): 3	Pos_x:	12.3137	Pos_y:	4.16797	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 4	Pos_x:	14.7936	Pos_y:	-5.82737	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
): 5	Pos_x:	37.0141	Pos_y:	2.52337	Vel_x:	-1e+09	Vel_y:	-1e+09
acking	status:	9						
	Pos_x:	17.0317	Pos_y:	4.43642	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9						
		38.4485	Pos_y:	16.3997	Vel_x:	-1e+09	Vel_y:	-1e+09
_	status:	9						
: 37	Pos_x:		Pos_y:	-2.79484	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9						
): 39	Pos_x:		Pos_y:	-2.05696	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9		0.00000		4		4 00
): 48	Pos_x:		Pos_y:	0.338239	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9	D	2 0 0 0 0 0		4	N-1	1 00
): 52	Pos_x:		Pos_y:	3.09899	Vel_x:	-1e+09	Vel_y:	-1e+09
	status:	9	Dec	0 07264	N/- 7	1 00	N-1	1 00
): 63	Pos_x: status:	50.831	Pos_y:	9.97264	Vel_x:	-1e+09	Vel_y:	-1e+09

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.	Value	Description			
		RANGE_INVALID	Range information is invalid.			
TRACK_STATUS_RAW_TARGET	Track is a raw target measurement and is not tracked.	RANGE_UNKNOWN	Range information is unknown.			
TRACK_STATUS_ACTIVE	Track is active/valid.	RANGE_NOT_AVAILABLE	Range information is not available.			
TRACK_STATUS_CIPV	Track is flagged as the closest in path vehicle.	RANGE_NONE	Not in-range.			
TRACK_STATUS_NEW	Track is new to the tracker, i.e. the start of a track.	RANGE_NEAR	Near range.			
TRACK_STATUS_NEW_UPDATED	Track is new and was updated.	RANGE_MEDIUM	Medium range.			
		RANGE_LONG	Long range.			
TRACK_STATUS_UPDATED	Track was updated.	RANGE_KIND_COUNT	Number of ps_range_kind values.			
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.					

Comparison

HelloWorldSubscriber	cpp × CANReaderNode.cpp × HelloWorldPublisher.cpp	x RadarSubscriber.cpp x	(ס		-		R.					
// Register as a	a listener for the message type that the publish	her		TODANSO"								
	<pre>send. Message type that the publis fend. Message types are defined in later tutor; r(_messageType);</pre>	als.		Particular and a								
PolySync Studio (HINDINGS MC								
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rspective 👻		+++++++++++++++++++++++++++++++++++++++	ziñao@zihao ThiokPar	W\$50% (0st)	local/priss	< /inaidi@vi	had ThinkPa	d-W550s-	/usr/local/pd	ol. × zihao@	zihao-ThinkPad-W550s;	: /usr/log
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e Model 🛛 🛛 🛛 🛛		t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-t-	ID: 52 Pos_x: Tracking status:	4458637Po	sPos_y:0.	03/03565	VVelx:	-11e+09	VVelyy:	-11e+09		
/isible		1 H H H H	ID: 63 Pos_x:	5058135	Pos_y:	1000613	Vel x:	-1e+09	Vel_y:	-1e+09		
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Labels		THAT	Tracking-status:	-9			Vel_x:	-16+09	Vel_y:	-1e+09		
Cars	ALLI	AAAA	ID: B Pos_x:	12.3137	Pos_y: 4	4.16797	Vel_x:	-1e+09	Vel_y:	-1e+09		
Trucks		THAS	Tracking status: ID: 4 Pos x:	9 14.7936 F	Doc us	5103737	10051					
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ADAR Track Stream	*			33.3674 PI	Posvy: -	2397796	Vel_x:	-10+09	Vel v:	-1e+09		
Visible			Tracking status:	9						-16+09		
Scale by amplitude			ID: 39 Pos_x: Tracking status:	6390706	Pos_y: ·	-2.03286	Vel_x:	-1e+09	Vel_y:	-1e+09		
Size				8195538	Pos_y: 1	12708896	Vellx: -	1e+099	Vellve .	16+099		
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Radial	1485926712856367 1485926712851320 9 -999999999		Tracking status: ID: 63 Pos_x:									
Cartesian	1485926712856367 1485926712850370 3 -999999999		Tracking status:	9	os_y: 1	0.0613	Vel_x: -:	Le+09 V	el_y: -	1e+09		
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23 yen the node has been created, it will cause an initStateEvent to

criberNode.connectPolvSvnc():

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