



# PhD Program- Radar Positioning System

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Madrid, 22nd may, 2020



ALEJANDRO BADOLATO Y JESÚS A. DEL CASTILLO	From Rail to Roads: an RPS roadmap	Government Europa, Quarterly 25		2018
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JESÚS ANTONIO DEL CASTILLO Y ALEJANDRO BADOLATO	MOBILITY IN SMART CITIES: The transport of the future.	Government Europa, e-book		2019
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ALEJANDRO BADOLATO Y JESÚS A. DEL CASTILLO	Millimeters-Wave radars for the railway industry.	SIGNAL+DRAHT (Eurail Press)		2018
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GÓMEZ-JÁUREGUI, V., DEL-CASTILLO-IGAREDA, J., MANCHADO, C., OTERO, C.	Quantitative Evaluation of Overlaying Discrepancies in Mobile Augmented Reality Applications for AEC/FM	Advances in Engineering Software, Vol. 127, pp. 124-140. doi: 10.1016/j.advengsoft.2018.11.002.	JCR Imp.Fact.: 3,198 D1 Q1 7/104, SJR Imp.Fact.: 1,159 D1 Q1 33/857	2019
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# ACHIEVEMENTS

## PAPERS AND PUBLICATIONS





PCT/IB2016/057119	Superficies codificadas que son leídas por sistemas tridimensionales.
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P201730236	Dispositivo de control de velocidad y detección de ferrocarriles.
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<b>PCT/IB2017/052056</b>	<b>Positioning System for Hiperloop transportation</b>
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## ACHIEVEMENTS (II)

### PATENTS



RADAR POSITIONING SYSTEM (LOS ÁNGELES- USA)	LaCOMOTION LEADERSHIP CONFERENCE	NEW CITIES FOUNDATION- 15-19 NOV, LOS ANGELES 2017
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RADAR POSITIONING SYSTEM (BERLÍN)	FUTURE MOBILITY CAMP	DEUTCHE BAHN AND BETAPITCH, 7TH DEC, 2017
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NUEVAS TECNOLOGÍAS EN ENTORNOS FERROVIARIOS (MADRID)	NUEVOS ACTORES DE INNOVACIÓN EN EL ÁMBITO FERROVIARIO	PLATAFORMA DE LOS FERROCARRILES ESPAÑOLES, MADRID, 22 DE FEBRERO DE 2018
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TRAINS ON THE ROADS: Platooning supported by RPS	31st United Nations/ CEFACT Forum	United Nations, Geneve, 23-27th April, 2018
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Semi- Final, best idea of a Spanish company. Ideas from Europe Nov, 2018	SME (European Union) Tallin
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## ACHIEVEMENTS (III)

### CONGRESSES AND CONFERENCES





<b>BASIC SKILLS</b>	2. Science and Technique (bibliographic study)	3. Technology (tools and instruments)	4. Activities Training (courses and seminars)	Results (papers & publications)	6. SWOT analysis	7. Schedule of works	8. Mobility	9. Funding and grants	10. Ethic
CB11 - Systematic understanding of a field of study and mastery of research skills and methods related to this field.	<b>6</b>	<b>10</b>	<b>6</b>						
CB12 - Ability to conceive, design or create, set up and adopt a substantial process of research or creation.				<b>10</b>		<b>10</b>	<b>10</b>		
CB13 - Ability to contribute to the expansion of the frontiers of knowledge through original research.				<b>10</b>					
CB14 - Ability to perform a critical analysis and evaluation and synthesis of new and complex ideas.					<b>8</b>				
CB15 - Ability to communicate with the academic and scientific community and with society at large about their fields of knowledge in the modes and languages of use usual in its international scientific community.				<b>8</b>			<b>8</b>		
CB16 - Ability to promote, in academic and professional contexts, scientific, technological, social, artistic or cultural advancement within a knowledge-based society.				<b>10</b>					<b>10</b>



<b>CAPABILITIES AND PERSONAL SKILLS</b>	2. Science and Technique (bibliographic study)	3. Technology. Tools and instruments	4. Formative activities (courses and seminars)	5. Results (publications)	6. Scientific Criticism (SWOT ANALYSIS)	7. Schedule of works	8. Mobility	9. Funding and grants	10. Ethic
CA01 - Desenvolverse en contextos en los que hay poca información específica.	<b>7</b>	<b>10</b>	<b>6</b>						
CA02 - Encontrar las preguntas claves que hay que responder para resolver un problema complejo.				<b>8</b>					
CA03 - Diseñar, crear, desarrollar y emprender proyectos novedosos e innovadores en su ámbito de conocimiento.						<b>10</b>		<b>10</b>	
CA04 - Trabajar tanto en equipo como de manera autónoma en un contexto internacional o multidisciplinar.			<b>10</b>				<b>10</b>		
CA05 - Integrar conocimientos, enfrentarse a la complejidad y formular juicios con información limitada.	<b>7</b>	<b>10</b>	<b>6</b>						
CA06 - La crítica y defensa intelectual de soluciones.					<b>8</b>				

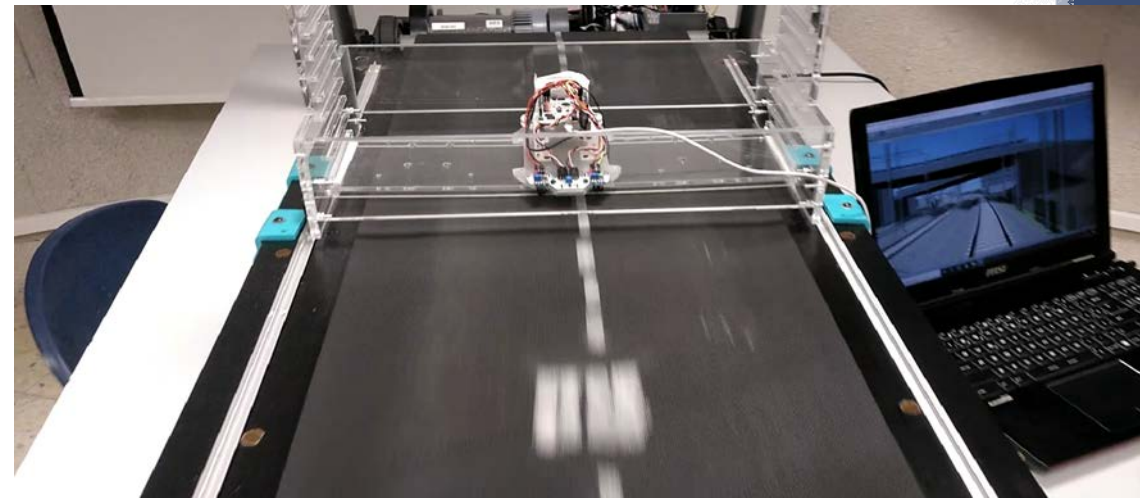
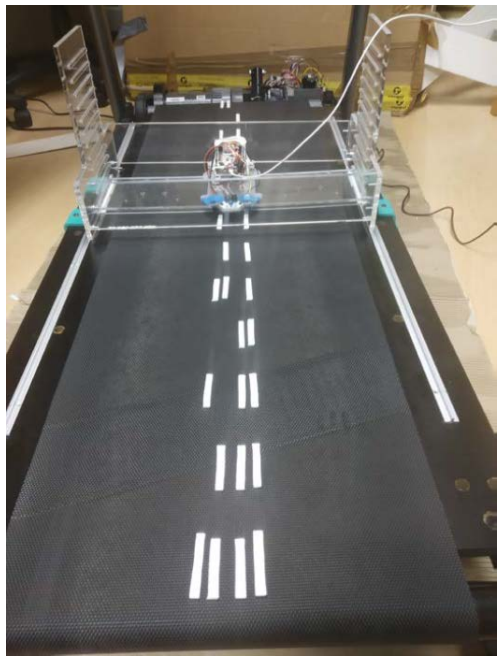


This machine has been developed in order to demonstrate the meaning and veracity of the RPS system at a lab. It was also interesting to have a first check of the way in which the **radar signal was synchronized and the software that processes it in a device** (a laptop, a PC or even a Tablet).

The design will be the subject of a utility model derived from typical treadmills in gyms: the ground moves forward while the mobile remains still. The result of the utility model is illustrated with various figures. During this 2019-2020 year, the complete exploded view of the design has been detailed by reverse engineering, allowing the design of a more specific device that can reach 40 or 50 km / h. The current one reaches speeds of 14 km / h.

# LAB'S TEST: RPS SIMULATION MACHINE EGIS-CAD DEPARTMENT

2019-20



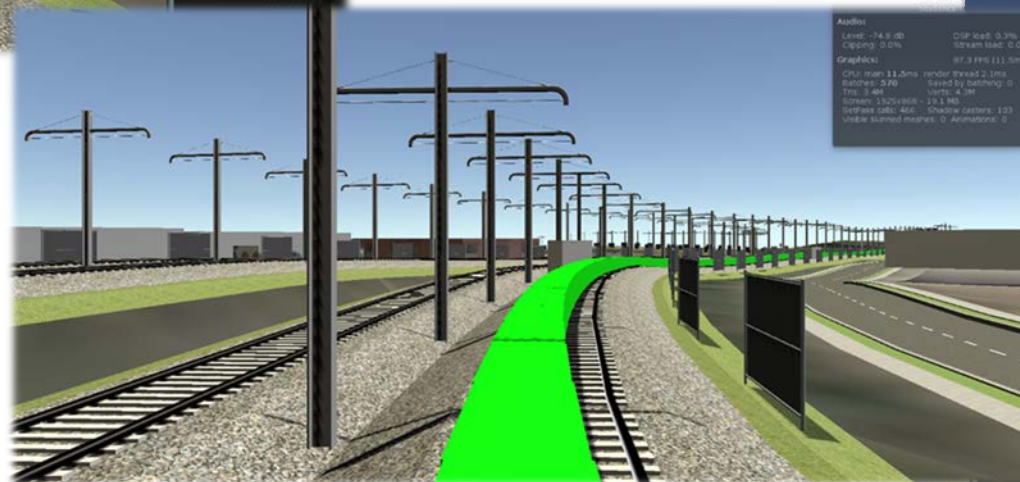
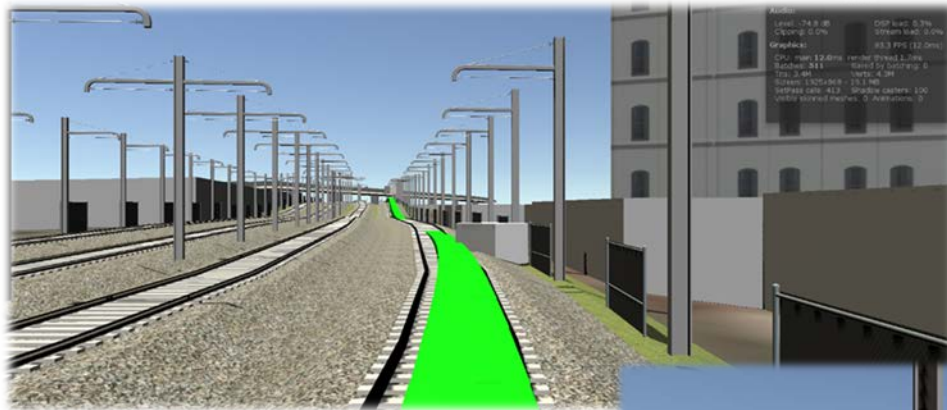


The simulation machine has the RPS sensor that sends the signal to a USB port and is processed by the graphical application.

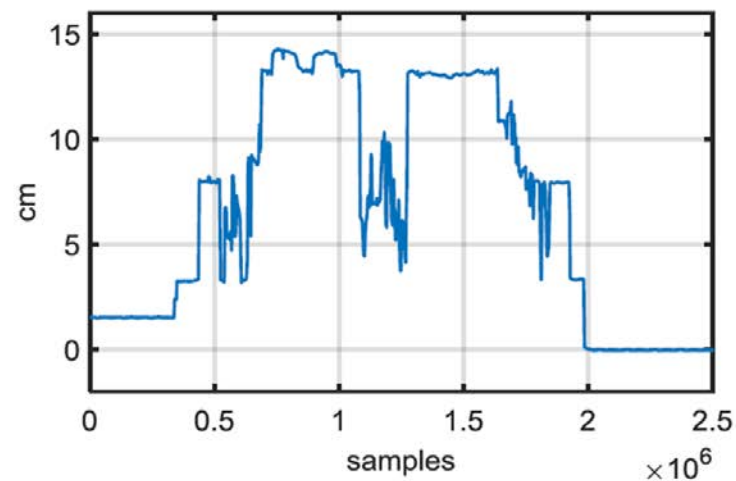
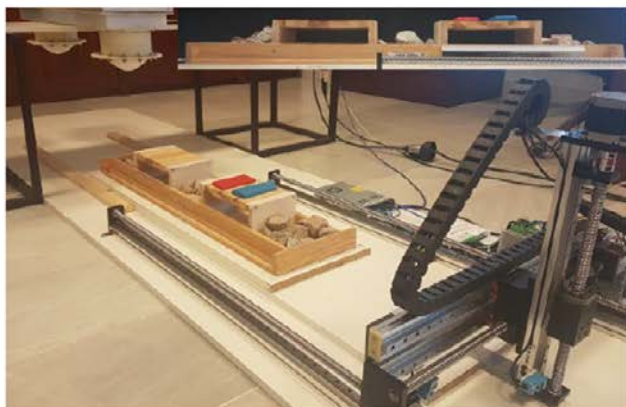
The RPS system is one-dimensional; reports the displacement of the radar along a linear track. This line may have a certain tolerance.

# LAB'S TEST: RPS SIMULATION MACHINE (II) EGIS CAD DEPARTMENT

2019-20







# LAB'S TEST: RPS SIMULATION MACHINE (III) ADS HEADQUARTERS

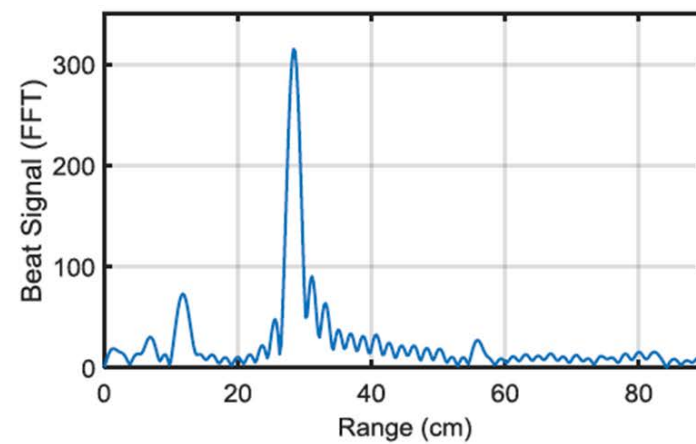
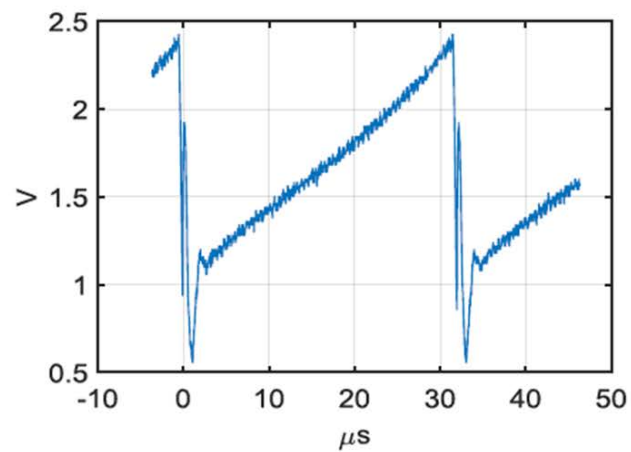


2019-20





## TEST IN REAL SCENARIOS



1<sup>ST</sup> TERM 2020

SAN MARTÍN DE LA VEGA,  
MADRID.

