

# Feasibility analysis of vibration based seat occupancy

<b>Description</b>
<p>Train operating companies are more and more interested in knowing the exact occupation state of their trains. Therefore, to detect the occupancy of each seat, new trains are equipped with seat occupancy sensors. These sensors are either installed in the seats (pressure sensors), or on the overhead luggage rack (radar, ultrasound, IR-sensors, optical...). However, all these solutions have a complex installation process (e.g. wire installation for the sensors and cut-outs into the luggage rack).</p> <p>In already existing trains, retro-fitting such intrusive sensors is expensive and infeasible. However, Televic assumes that the vibration pattern of a seat sufficiently and uniquely changes between an occupied seat and an empty seat. This is however an unproven assumption.</p> <p>It is the goal of this thesis to build a vibrational simulator in an open game engine. Once this simulator is built, it is the goal to do a feasibility study and algorithm design. The thesis student will first build a vibrational simulator and then use this simulator to develop and verify algorithms that perform seat occupancy detection.</p> <p>If you are interested in this topic, please also register this on the Televic website at: <a href="https://www.televic.com/en/careers/internships-and-students">https://www.televic.com/en/careers/internships-and-students</a> so we can confirm the topic is still available.</p>
<b>Televic Company/Department:</b>
<p>Televic develops, manufactures and installs top end high-tech communication systems for specific niche markets. A financially independent and stable group, Televic is divided into divisions that each focus on their specific market:</p> <ul style="list-style-type: none"><li>• <a href="#">Televic Rail</a>: passenger information systems and on-board control systems for trains</li><li>• <a href="#">Televic Healthcare</a>: communication systems for healthcare</li><li>• <a href="#">Televic Conference</a>: conference systems for large venues</li><li>• <a href="#">Televic Education</a>: multimedia and e-learning solutions for staff training and educational institutions</li></ul> <p>Televic creates added value for its customers by developing custom-made solutions and by continuously innovating at the cutting edge of technology.</p> <p>With headquarters in Belgium and offices and plants across Europe, Asia and the US, Televic employs nearly 700 people worldwide.</p> <p><b>About Televic Rail</b></p> <p>With over 30 years of experience in designing, manufacturing and maintaining on-board communication and control systems, Televic Rail is a leading, trusted partner for railway operators and train builders worldwide.</p> <p>Its Passenger Information Systems and Control Systems are high quality, tailor-made solutions that offer the flexibility, user-friendliness and stability that our clients ask for. Our various types of on-board control systems such as our bogie monitoring systems are innovative yet reliable products which are designed specifically for the railway business.</p> <p>Trains and trams all around the world are equipped with Televic Rail solutions, from New Zealand to Canada, from China to the United States, from India to Belgium, England and France.</p>
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<b>Nature of the work</b>					
Level	Specialty	Type of work.	Location	Type of activities	Num of students
Academic Master, Master	Electronics / Hardware, Mechanical / Product design	Research: 60% Implem.: 25% Experim.: 15%	Televic, University	Experimenting, Literature study, Simulation	1