

# Parametric study for IMS calibration

## Description

In order to predict bogie instabilities due to extreme speed profile, short track radii, lateral gust winds etc..., we have developed an instability monitoring system (IMS) that can trigger a safety line when such instability is crossed.

This IMS system will continuously look for acceleration oscillations, and trigger an instability flag when the oscillations count goes above a given threshold.

This instability threshold is given by the train builder and purely based on experimentation.

The goal of this thesis is to make use of an inhouse multi-body bogie model to be able to find out the instability threshold in function of the bogie stiffness, dampening ratios, mass distribution and geometries.

The student will have to perform a parametric study in order to express the instability threshold.

Required knowledge:

\* Physics (basics of mechanics, conservative law of mass, energy and momentum...)

\* Basis of simulation (notion of causality, numerical simulation ..)

\* Matlab and C++

If you are interested in this topic, please also register this on the Televic website at:

<https://www.televic.com/en/careers/internships-and-students> so we can confirm the topic is still available.

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Televic creates added value for its customers by developing custom-made solutions and by continuously innovating at the cutting edge of technology.

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### About Televic Rail

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.

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.

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.

## Contact

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**Nature of the work**

Level	Specialty	Type of work.	Location	Type of activities	Num of students
Academic Master, Master	Mechanical / Product design, Software	Research: 10% Implem.: 30% Experim.: 60%	Televic, University	Experimenting, Simulation	1