Vehicle-based switching

Nabilah Farhat

Dr. Christopher Ward & Dr. Roger Dixon

Loughborough University

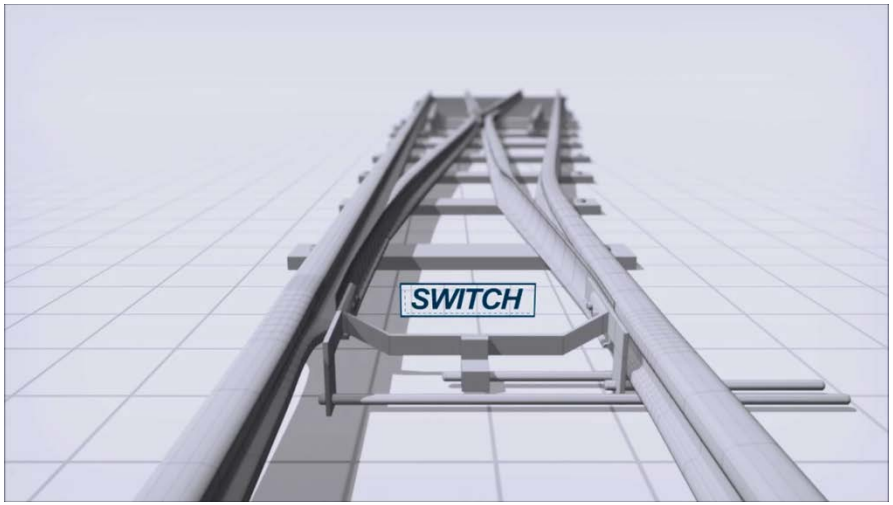
Loughborough University

UKACC PhD Presentation Showcase

UKACC

Project motivation

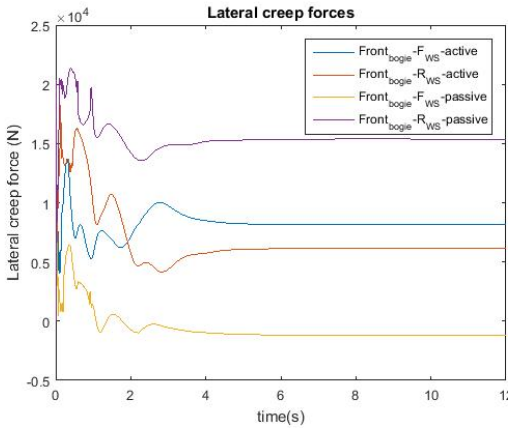
- **Switches and crossings (S&Cs) create a multi-route rail network**

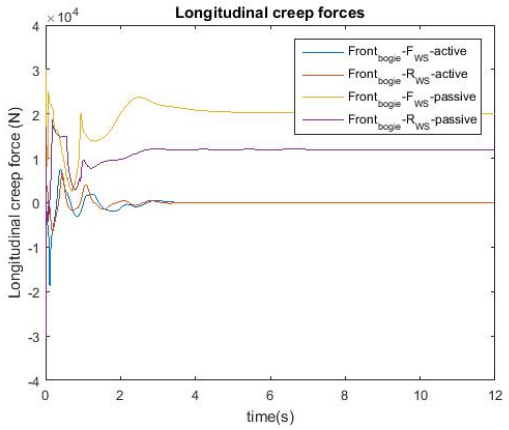


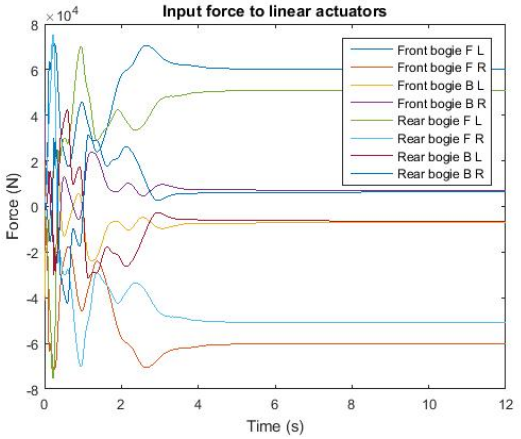
- **Replacement uses 2/3rd of track maintenance costs**
- **This project will aim to develop a proof of concept for vehicle instead of track-based switching**

Active steering

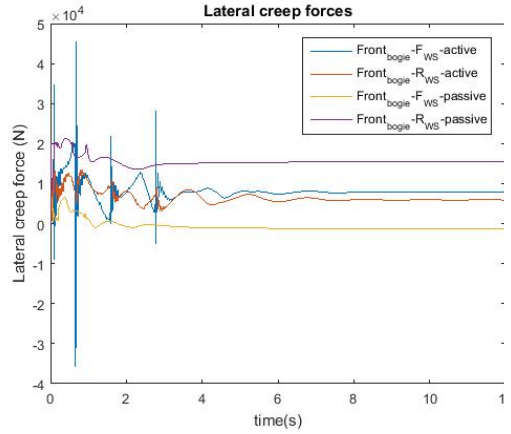
ASW

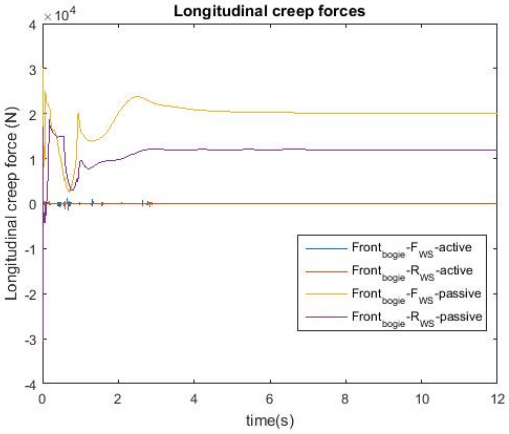


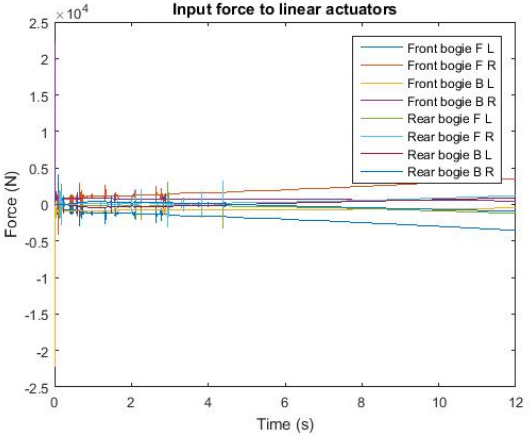




AIRW







Wear performance

Table 1. Tγ values on curved track

	Passive	SYC	ASW	AIRW
Front bogie front wheelset	52.92	57.70	9.12	8.62
Front bogie rear wheelset	109.50	2.38	4.94	3.95
Rear bogie front wheelset	71.49	93.98	4.94	0.98
Rear bogie rear wheelset	117.00	71.67	9.12	3.65
Total Tγ on all wheelsets	350.91	225.73	28.12	17.20
Percentage of passive	100	64.43	8.01	4.90

Table 2. Tγ values on straight track

	Passive	SYC	ASW	AIRW
Front bogie front wheelset	0.0968	0.0322	0.2131	0.0007
Front bogie rear wheelset	0.9717	0.2872	1.7734	0.0021
Rear bogie front wheelset	0.2515	0.0365	0.0666	0.0039
Rear bogie rear wheelset	0.9380	0.2245	1.7370	0.0018
Total Tγ on all wheelsets	2.2580	0.5804	3.7901	0.0085
Percentage of passive	100	25.70	167.85	0.38

Potential impact

- **Active elements could fully control the vehicle**
- **Reduce maintenance costs**
- **Increased system reliability**
- **Could be combined with electronic coupling systems**
- **Operational flexibility**

Time	To	Plat.	Exp.
19:12	Guildford	11	On Time
19:15	Hampton Court	11	On Time
19:18	Guildford	11	On Time
19:21	Shepperton	11	On Time
19:25	Chessington Sth	11	On Time
19:27	Exeter St Davids	9	On Time
19:27	Westbury	9	On Time
19:29	Woking	11	On Time
19:33	Dorking	11	On Time
19:36	Strawberry Hill	11	On Time
19:46	Southampton Ctl	9	On Time
19:52	Portsmth & Ssea	9	On Time

Thank you for listening