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Nota di contenuto	Design and Modelling -- Dynamic analysis of Train-Track-Substructure Interaction for Detection of Acceleration Sensitive Areas of a Rail -- Next Generation Switch and Crossing Systems -- Statistical Model of Railway's Turnout Based on Train Induced Vibrations.-Metallurgical Characterization -- Damage and Microstructure of In-Field Loaded Railway Steel -- Metallurgical Investigation of Switches and Crossings -- Analysis of Rail Screw Failures -- Condition Monitoring and Asset Management -- Data Based Condition Monitoring and Prediction Analytics for Turnouts -- Monitoring of Switches and Crossings Using Smart Sensors -- Detecting Faults in Turnouts with the Track Recording Car -- Automatic Detection of Railway Failures from Images -- Fault Detection, Diagnosis and Prognosis of Point Operating Equipment -- Data Sources and Research Models for Turnouts -- The Effect of

## Tamping on Railway Track Geometry in Turnouts -- The Principles, Organization and Instrumentation of an Asset Management System -- Ways to Improve the Performance and Costs of Turnouts.

### Sommario/riassunto

This book focuses on the latest scientific and technological advancements in the field of railway turnout engineering. It offers a holistic approach to the scientific investigation of the factors and mechanisms determining performance degradation of railway switches and crossings (S&Cs), and the consequent development of condition monitoring systems that will enable infrastructure managers to transition towards the implementation of predictive maintenance. The book is divided into three distinct parts. Part I discusses the modelling of railway infrastructure, including switch and crossing systems, while Part II focuses on metallurgical characterization. This includes the microstructure of in-field loaded railway steel and an analysis of rail screw failures. In turn, the third and final part discusses condition monitoring and asset management. Given its scope, the book is of interest to both academics and industrial practitioners, helping them learn about the various challenges characterizing this engineering domain and the latest solutions to properly address them.