“Innovations in Construction and Maintenance of Railway Lines”

The construction or renewal of railway lines involves numerous well-coordinated work steps. In the fields of railway track construction and maintenance, increasingly powerful large-scale machines are being used, enabling a high degree of automation in these processes. The aim of this thesis is to systematically analyse recent innovations in track construction and maintenance methods, as well as the machinery used in these processes. The thesis should begin with a comprehensive description of the typical workflows involved in the construction and renewal of railway lines. This will be followed by international research into different approaches to track construction and maintenance. The aim is to investigate which technologies and machines are used in selected countries and what innovative developments are currently emerging. These approaches should then be evaluated and compared based on defined criteria, such as the degree of automation, personnel deployment, or construction speed. Finally, the thesis should explore the potential of digitalization for the future advancement of track construction and maintenance processes. Based on this, recommendations should be developed on how digital tools and technologies could be effectively integrated into existing procedures.