

Title (en)
OPTIMISATION OF THE DRILLING OF A TUNNEL-BORING MACHINE ACCORDING TO LAND/MACHINE INTERACTIONS

Title (de)
OPTIMIERUNG DER BOHRUNG EINES TUNNELBOHRERS IN ABHÄNGIGKEIT VON DEN WECHSELWIRKUNGEN ZWISCHEN BODEN UND MASCHINE

Title (fr)
OPTIMISATION DU FORAGE D'UN TUNNELIER EN FONCTION D'INTERACTIONS TERRAIN/MACHINE

Publication
EP 3647533 A1 20200506 (FR)

Application
EP 19207267 A 20191105

Priority
FR 1860155 A 20181105

Abstract (en)
[origin: AU2019257539A1] The invention relates to a method (S10) for optimizing the characteristics of a tunnel boring machine, particularly a tunnel boring machine of the slurry pressure or VD type, said method comprising the following steps: S0: determining a ground/machine interaction model, S11: instantaneous measurement of the set of specific boring parameters of the tunnel boring machine, S13: determining the group of individuals corresponding to the boring parameters measured in step S11 by means of the ground/machine interaction model, S14: optimizing the characteristics of the tunnel boring machine as a function of the group of individuals thus determined. Figure 3 Obtaining a set of boring parameters of at least one given Si tunnel boring machine over at least one boring site Identifying a set of formulas depending on all or a part S82 of the boring parameters Determining a set of variables based on the S3 SO< formulas thus identified Applying a non-supervised classification algorithm to the S4 variables so as to obtain groups of individuals Applying a supervised classification algorithm to the variables and to S5 the groups of individuals thus determined so as to obtain a ground/ machine interaction model Instantaneous measurement of the set of Sil boring parameter of the tunnel boring machine |Calculating all or a part of the variables determined in step S3 S12 based on the boring parameters measured in step S1 1 IDetermining the group of individuals corresponding to the instantaneous boring S13 parameters by means of the ground/machine interaction model Optimization of boring as a function of the group S14 of individuals thus determined

Abstract (fr)
L'invention concerne un procédé (S10) d'optimisation de caractéristiques d'un tunnelier, notamment d'un tunnelier de type à pression de boue ou VD, ledit procédé comprenant les étapes suivantes :S0 : détermination d'un modèle d'interactions terrain/machine,S11 : mesure instantanée de l'ensemble des paramètres spécifiques de forage du tunnelier,S13: détermination du groupe d'individus correspondant aux paramètres de forage mesurés à l'étape S11 à l'aide du modèle d'interactions terrain/machine,S14 : optimisation des caractéristiques du tunnelier en fonction du groupe d'individus ainsi déterminé.

IPC 8 full level
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Citation (applicant)

- WO 03087537 A1 20031023 - STARLOY CORP [JP], et al
- EP 1098066 A1 20010509 - WIRTH CO KG MASCH BOHR [DE]
- US 5330292 A 19940719 - SAKANISHI SHOICHI [JP], et al
- EP 1253287 A1 20021030 - NFM TECH [FR]
- JP H11270283 A 19991005 - TAISEI CORP
- JP H09228778 A 19970902 - KUMAGAI GUMI CO LTD, et al
- FR 2874959 A1 20060310 - BOUYGUES TRAVAUX PUBLICS SA [FR]

Citation (search report)

- [A] CN 107577862 A 20180112 - CHINA RAILWAY ENGINEERING EQUIPMENT GROUP CO LTD
- [A] KR 20180116922 A 20181026 - UNIV INHA RES & BUSINESS FOUND [KR]
- [A] LAU S C ET AL: "Applying radial basis function neural networks to estimate next-cycle production rates in tunnelling construction", TUNNELLING AND UNDERGROUND SPACE TECHNOLOGY, ELSEVIER SCIENCE PUBLISHING, NEW YORK,NY, US, vol. 25, no. 4, 16 March 2010 (2010-03-16), pages 357 - 365, XP027035521, ISSN: 0886-7798, [retrieved on 20100316]

Cited by
CN112796768A; FR3121705A1

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