



The Japan Society for Precision Engineering

Introduction of JSPE Young Researcher Awards 2014

1. Naoyuki ITO

Straightness Profile Measurement by Sequential Two-Point Method Utilizing a Laterally Shifting Reference plate

J. JSPE, Vol.80, No.1, pp.75-80

This paper deals with invention of a new measurement principle for straightness profile measuring instrument based on numerical software datum. The novel sequential two-point method was realized using a twin heads displacement sensor and a shifting reference plate in the lateral direction. Utilizing a precise level meter for correction of the reference plate slope, a long distance straightness profile can be measured in an extrapolative way. Uncertainty analysis on designed specifications of the measuring instrument assured its high accuracy and practicality. The experimental variation of straightness profiles measured by a developed measurement system was in a good agreement with the numerical simulation.

2. Tsubasa MARUYAMA

A Development of a Basic Walking Simulation in As-built Environments by Combining Digital Human Model with Large-scale 3-Dimensional Laser scan

J. JSPE, Vol.80, No.8, pp.755-762

Recently, to realize safer and more access-friendly environments, the accessibility evaluation for unhealthy people such as the elderly and disabled is becoming more and more important. To realize the reasonable and reliable accessibility evaluation, in the future, the human behavior simulation in 3-dimensional environments has a great potential. However, manually building such 3D environment models for the simulation is costly and time consuming, and it is sometimes inaccurate and do not necessarily capture the as-built environments. Additionally, the pedestrian model should also simulate detailed and various human motions as recent digital human simulations do. Therefore, our final goal is to realize the accessibility evaluation of "as-built" environments based on the detailed human behavior simulation. To achieve the goal, in this paper, we propose a method where as-built 3D environment models can be constructed in a fully automatic way from laser-scanned 3D point clouds measured from as-built environments. Additionally, we propose a

basic walking simulation function of the digital human model (DHM) in the as-built environment models. Our proposed simulation enabled a DHM to automatically walk utilizing the functions of the global path findings, the walking path location control, the local collision avoidance and the walking motion generation. Moreover, we applied our modeling and simulation algorithms to the complex as-built environments : a two-storey indoor environment which includes caracoles and stairs, and an outdoor environment which includes slopes. The efficiency and effectiveness of the modeling and simulation were confirmed.

3. Hiromitsu FUJII

Automated Recognition of Material Condition Using Boosting Algorithm in Hammering Test

J. JSPE, Vol.80, No.9, pp.844-850

Automated diagnosis systems are necessary for maintenance of superannuated social infrastructures. This paper presents an automated classification method to detect defects of materials using acoustic signals in hammering test. The approach consists of two steps. The first step is extraction of features using Short-Time Fourier Transform (STFT) and the second one is training of classifiers based on AdaBoost which is a kind of ensemble learning algorithm. We use the weak classifiers based on simple template matching method, which can consider both variable scale of amplitude and variable range of frequency. In the experiments, we discriminate between woody and metal materials by different methods of hammering test, which are tapping and rubbing. Furthermore, our method can be applied to actual diagnosis; detection of crack in plaster walls.

4. Kensei KANEKO

Crack-less Electrical Discharge Machining of Molybdenum (2nd Report):-Effect of Crystal Grain Anisotropy on Crack Generation-

J. JSPE, Vol.80, No.9, pp.873-878

Molybdenum (Mo) is often machined by electrical discharge machining (EDM) because of its high hardness. The cracks did not occur by EDM with a silicon electrode in deionized water. The silicon electrode cannot be used for small-hole EDM because of its heavy wear. Mo was machined by EDM with a Ti electrode in deionized water, while many cracks occurred in the base material and recast layer

in the case of the positive electrode polarity. The cracks might generate by crystal grain boundary embrittlement. Because an Mo rolled plate has crystal grain anisotropy, the machining direction has an effect on the crack direction or density. In this study, the effect of the crystal grain anisotropy on the crack generation was investigated. The crack direction and density in the EDMed surface and cross section is parallel to the crystal grain boundary of Mo on the positive electrode polarity. In the case of the machining in the rolling and transvers direction, the crack reached more deeply than that in the normal direction. In contrast, the EDMed surface and cross section indicated crack-less on the negative electrode polarity.

Introduction of JSPE Takagi Awards 2014

1. Development of Multiple Optical Paths Grating Projector for High-speed Shape Measurement

Daisuke ASAI, Teiji MIYAGI (HIKARI Co.,Ltd.), Motoharu FUJIGAKI (Wakayama Univ.)
J. JSPE, Vol.80, No.3, pp.316-321

2. The Boundary of Key-hole Generation in Micro-welding of Aluminum Alloy by Pulsed Nd:YAG Laser with Superposition of Continuous Diode Laser

Shin-ichi NAKASHIBA (Kataoka Corporation), Yasuhiro OKAMOTO (Okayama Univ.), Tomokazu SAKAGAWA (Kataoka Corporation), Masanori HARADA, Akira OKADA (Okayama Univ.)
J. JSPE, Vol.80, No.4, pp.419-424

Call for Papers

16th International Conference on Precision Engineering

ICPE2016

14(Mon.)-16(Wed.), November 2016 @ Hamamatsu, Japan

Organized by The Japan Society for Precision Engineering

The 16th International Conference on Precision Engineering (ICPE2016) will be held on 14-16th November 2016 at Hamamatsu city, Shizuoka, Japan. The conference will be held at ACT CITY HAMAMATSU, surrounded by traditional culture.

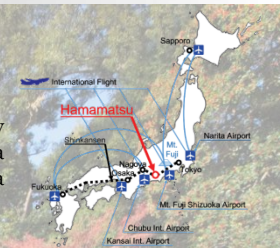
Conference Topics

ICPE 2016 focuses on the following topics and keywords.

- **Advanced Precision Machining and Technologies**
Polishing, Grinding, CMP, EDM, Laser
- **Die and Mold Manufacturing**
Molding, Injection, Imprinting, Material
- **Additive Manufacturing and 3D Printing**
3D printer, Cold spray, Stereolithography
- **Machine Tools and Elements**
High feed rate, High speed spindle
- **Digital Design and Manufacturing Systems**
CAD/CAM, Simulation, 3R, Concurrent Engineering
- **Green and Sustainable Manufacturing and Technologies**
Low power manufacturing, Low energy consumption
- **Control and Ultra Precision Positioning**
Control theory, Monitoring, Simulation
- **Precision Measurement and Calibration**
3D measurement, Surface, Laser, SPM, Standard
- **MEMS/NEMS**
Sensor, Actuator, Electro-mechanical system
- **Bio-Medical Engineering and application**
Bio-chips, Medical system,

Venue

Access to Hamamatsu City from Mt. Fuji Shizuoka Airport and Chubu or Narita Int. Airport.



Important Dates

Abstract submission 15th, January 2016

<Post deadline application>

Notification of abstract acceptance	15 th , January 2016
Full paper submission	18 th , March 2016
Notification of final acceptance	20 th , May 2016
Camera-ready manuscript	22 nd , July 2016

Abstract submission

Submit your paper/poster abstracts through your personal webpage on the ICPE 2016 website:

<http://icpe2016.jspe.or.jp/>

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