

K. ISHIDA, N. KANO, K. KIMOTO. **Shape recognition with point clouds in rebars.** *Gerontechnology* 2012;11(2):89; doi:10.4017/gt.2012.11.02.344.00 **Purpose** In this paper, the authors describe the methods of inspecting the quality of reinforced concrete structure using point-clouds data acquired from a 3D-laser scanner. A 3D-laser scanner is an outstanding device to analyze a real-world object and to collect digital data on its shape. Inspections of the quality of reinforced concrete structure using point clouds are required for novel methods which count the quantity of rebar material and to check the space of each rebar. **Method** To inspect with the use of 3D-point clouds, we developed a method of 3D-point-clouds recognition of the rebars elements. In this paper the authors show three methods to analyze point clouds collected in rebars of building structures. Firstly, the authors developed a method of noise reduction to make a clear distinction between object surface points and noise points; this is important because point clouds in rebars have much noise that can disturb subsequent analysis. Secondly, the authors developed a method of abstracting point clouds on reinforcement bars. Thirdly, the authors developed a method dividing point clouds on reinforcement bars into hoops and wall horizontal reinforcement bars. The authors scanned reinforced bars of columns and walls at a construction site of an apartment and then applied the three methods to analyze the point clouds data. **Results & discussion** In this experiment, our methods were able to identify 3D point clouds as main bars, horizontal bars, and hoops (*Figure 1*). We were able to measure the object from 3D-point-clouds data at any time as well as being able to develop an automatic inspection system.

Keywords: quality control, 3D laser scanner, 3DCAD, point cloud, reinforcement work

Affiliation: Waseda University, Tokyo, Japan; E: vrsoturon@yahoo.co.jp

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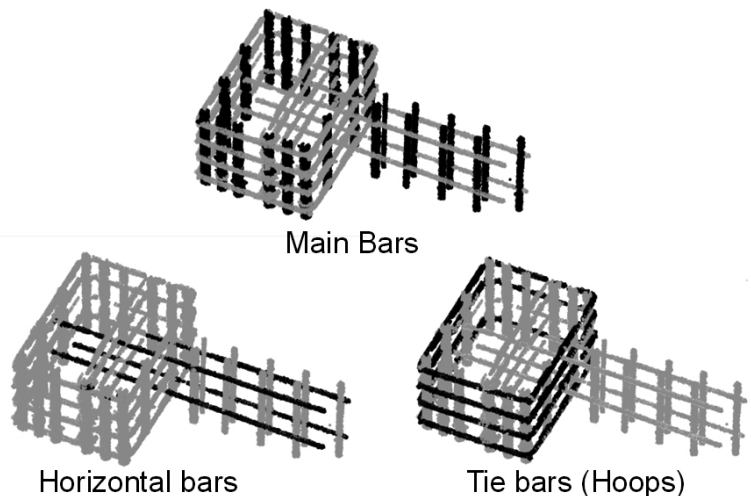


Figure 1. The result of recognizing three elements of rebars from 3D point clouds