

蛍狩り測定カメラを活用した部品トレイ 認識技術の開発

—測定方法の確立と精度向上—

*A Parts Position Recognition Technology Based on Firefly Catching Measurement
— To Make a Measurement and Accuracy Improvement —*

小池 尚己*
Naoki Koike

曾我 光英*
Mitsubide Soga

An inexpensive and flexible technique for gripping devices with a robot hand was developed by applying a three-dimensional position measurement system (known as firefly catching measurement) developed in our research department. The features of this measurement system are that the target to be measured, which is a pattern marker with a density distribution, can be recognized with a low-cost camera and its three-dimensional position and orientation can be measured. In this study, an attempt was made to gain further accuracy by devising noise factors and establishing a measurement accuracy evaluation method using the S/N ratio. Through a series of parameter design exercises, positional recognition accuracy was improved by 16.1 db in terms of S/N ratio and by a factor of 6.4 in terms of true value.

Key words : three-dimensional position measurement system, production equipment, robot hand, camera, pattern marker with concentration distribution, grasp parts, Taguchi methods, quality engineering, S/N ratio, noise factor, parameter design

1. 背景と本研究の目的

当社において、トナーカートリッジは最も部品点数が少なく、かつ生産量が多い自動化適性の高い製品であることから、自動化設備を導入した量産組立を実現している(図1)。更なるコスト競争力を高めるために、自動化の対象領域を広げる活動を行っており、その中の活動の1つとして設備の機能とコストの見直しを行っている。

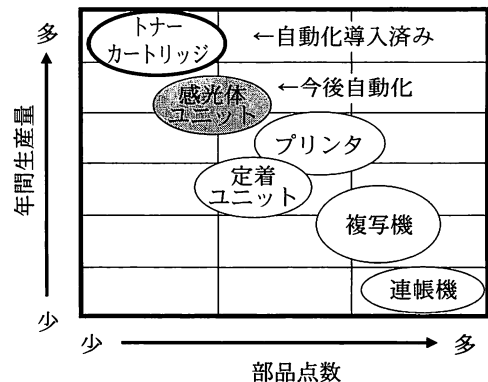


図1 ユニットごとの部品点数と生産量の関係

*富士ゼロックス(株), 正会員