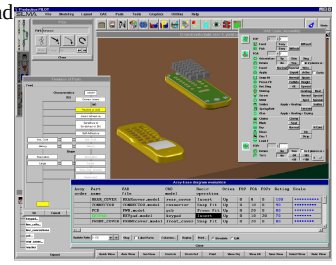
Manufacturing System Design
Chairs: Tamio Arai, N. Viswanadham

Using Assembly Scoring as an Entry into Production Line Design

R. Guptill and M. C. Cheng
Adept Technology, Inc.

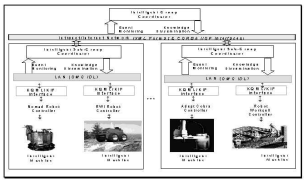
- Shorter production cycles demand better planning tools.
- Product Designers can influence production line design.
- Sony DAC assembly scoring system is well established.
- Integration with Line simulator speeds up final line design.



A Framework for the Development of Agile Manufacturing Enterprises

R. Kolluru, S. Smith, R. Loganantharaj, T. Chambers, G. Seetharaman and T. D'Souza
University of Louisiana at Lafayette

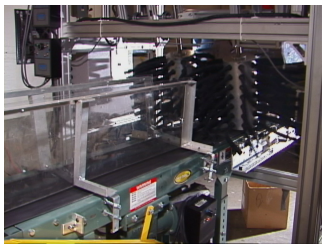
- Control and Communications framework for manufacturing enterprise agility
- Distributed intelligence / information framework
- CORBA / Java / KQML and XML



Design Criteria for Developing an Automated Live Bird Transfer System

Kok-Meng Lee
Georgia Institute of Technology

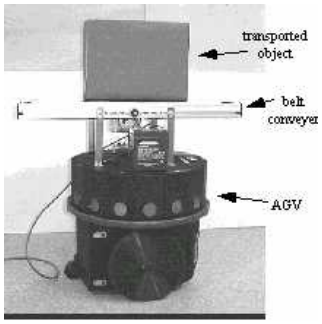
- The repetitive task of transferring live objects, which typically characterized by varying sizes and shapes, and have natural reflexes, is often laborious and hazardous. We present the method to automate the process of transferring singulated live birds from a moving conveyor onto a processing line without causing damage or stress.
- The system uses revolving flexible fingers to manipulate the leg kinematics of the bird on a moving conveyor so that both legs of the bird are inserted into the shackle. We use motion simulation to trade-off between the bird stability and the insertion requirement for a range of size variation.
- Twelve different experimental trials were conducted with 120 novice broilers from a poultry processing plant to examine the effects of key design parameters and to evaluate the system performance. The experiment shows that the bird's visual reflex and initial posture have significant effects on the system performance.
- The design principles for developing an automated live-bird transfer system have been developed. Along with the identification of key parameters that significantly affect the system performance, the system was experimentally evaluated using live broilers. The system has the ability to accommodate a limited range of varying sizes, shapes, and some natural bird's reaction to grasping.



Flexible Transport System by Cooperation of Conveyer-Loaded AGVs

Jun Ota, Kousuke Inoue, Ryousuke Chiba, Tomokazu Hirano and Tamio Arai
University of Tokyo

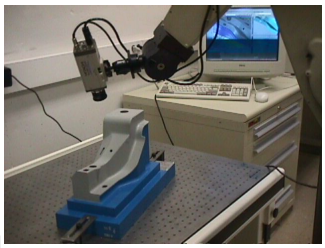
- A new module for flexible material handling
- A module integrating a conveyer and an AGV
- Hand-over operation between the two modules to avoid deadlock
- Transport simulation of model factory environments



Design of Synchronized Supply Chains: A Six Sigma Tolerancing Approach

Y. Narahari[1], N. Viswanadham[2] and R. Bhattacharya[1]
[1]Indian Institute of Science and [2]National University of Singapore

Automated CAD-Guided Automobile Part Dimensional Inspection

W. Sheng[1], N. Xi[1], M. Song[2], Y. Chen[2] and J. S. Rankin III[2]
[1]Michigan State University and [2]Ford Motor Company

- Camera positioning for part dimensional inspection
- Novel approach combining generate-test and synthesis methods
- Experimental evaluation using automobile parts
- Straightforward and easy to implement with low computational cost