Keynote IV

This is a version adjusted and altered due to copyright protection

Hide Sasaki, Ph.D.
Honorary Research Associate
Dept. of Comp. Sci. & Eng., Chinese Univ. of Hong Kong

Editor-in-Chief
Organizational and Collective Intelligence (IJOCI), IGI Press
Sept. 29, 2011
Rome, Italy
What Do We Discuss Today?

- We may learn much from Nature
  - But, is it really good to follow?

- Why do you need to know this?
  - A good path for node tracking in clouds
  - A better understanding of optimization in cognitive approaches
Get to Know!

• Collective behavior of social animals inspires optimization
• Does nature-inspired optimization give anything back to behavioral biology?
• Is anything common between human and animal decision making?
Have You Seen Real Animal Collective Behavior?

• A global optimization in ant colonies inspires Ant Colony Optimization (ACO)
  – Ants use a chemical compound attracting others to follow trails to forage
  – Such that compound is known as pheromone
  – This pheromone trail is the source of technical inspirations for ACO
First Question: Is This Really Optimal?

- Pheromone trail is effective as global communication
- However, ants have the more direct and efficient communication tool
- That is encounter and contact with antennae
Activity-Level Optimization

- Encounter and contact with antennae are more effective in decision-making
What theory explains this unexpected inactivity?

• When you make clear this inactivity, you can produce real artificial ants
  – The questions are:
    • Is the source of technical inspirations is not optimal?
    • What does that phenomenon mean in the context of optimization?
Conclusion

- Nature provides diverse sources of technical inspirations
- Technical optimization gives back analytical tools to nature
- Human decision making becomes a basis of analysis on animal collective behavior