Operation Research:
Techniques Seeking for Optimization

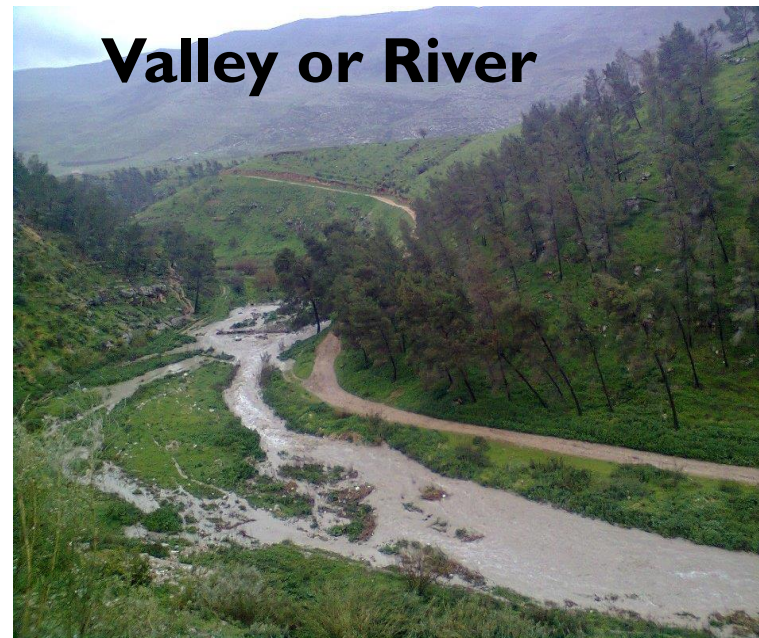د.قصي حميد السلامي
قسم ادارة الأعمال
كلية العلوم الإدارية والمالية
جامعة جيهان
2022-2023

Operations Research (O.R.): is the application of the scientific methods to complex problems arising from operations involving large systems of men, machines, materials and money in the industry, business, government and defense.

O.R. is the study of mathematical models for complex organizational systems.

Linear Programming (Ex. World War II)

British

German Army

Manager or President

Valley or River

Manager or President

Ice Mountains

Desert

Rock Mountains

Rockets

Marines

Jet Fighter

Now, which is the optimal strategy we must use it to win the war?

Tanks

Landing Soldiers

Linear Programming (Mixed Productions)

If we have:

- 20 eggs
- 2.5 Kg sugar
- 3.25 Kg flour
- 2 liters milk
- 3 hours
- 2 box yeast
- you work alone

How many products we can make it by these available items?

Linear Programming (Recourse Allocation)

Which is the better cutting methods?

Transportation Problems

Which way we must select it to minimize the cost?

Game Theory

How we can maximize the profit?

An Empirical Study for Competition Case between Iraqi Telecommunication Companies Using Game Theory

Kusay H. Al-Salami[*], Zaid Taha Sawadi[**], Ibraheem A. Saadi[*]

[*] *Department of Business Administration, College of Administrative and Financial Sciences, Cihan University, Erbil, Iraq*
[**] *University of Mosul, Mosul, Iraq*

Abstract - Telecommunication companies in Iraq are experiencing a huge competition in the market nowadays. Each company is striving to attract more customers through providing with any problem in which each player's strategy depends on what other players do.

In this research game theory techniques will be practically applied

Book of Abstracts

13th Annual World Congress of the
Academy for Global Business Advancement (AGBA)
www.agba.us

November 26---28, 2016

Develop Competitiveness Model in Business to Include Cooperation Case: An Application of Game Theory
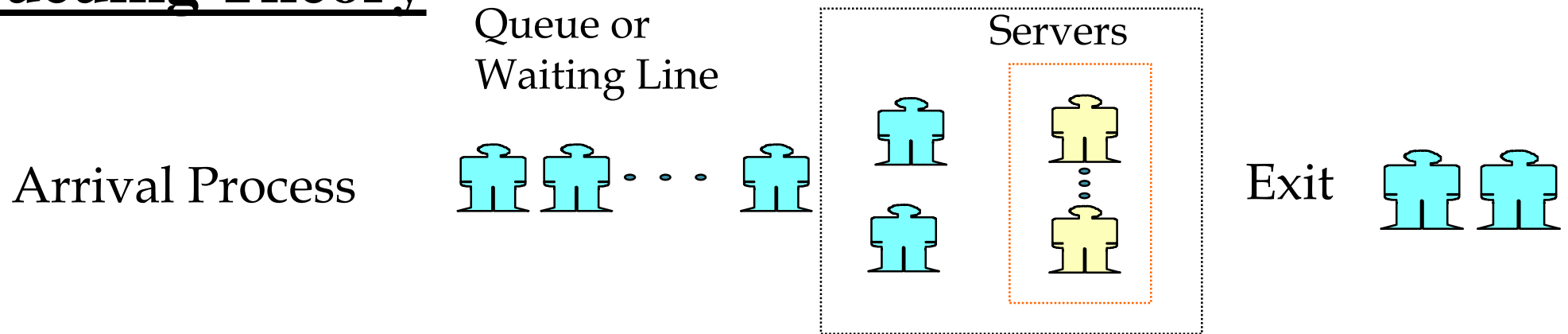
Kusay H. Al-Salami
CIHAN University, Iraq

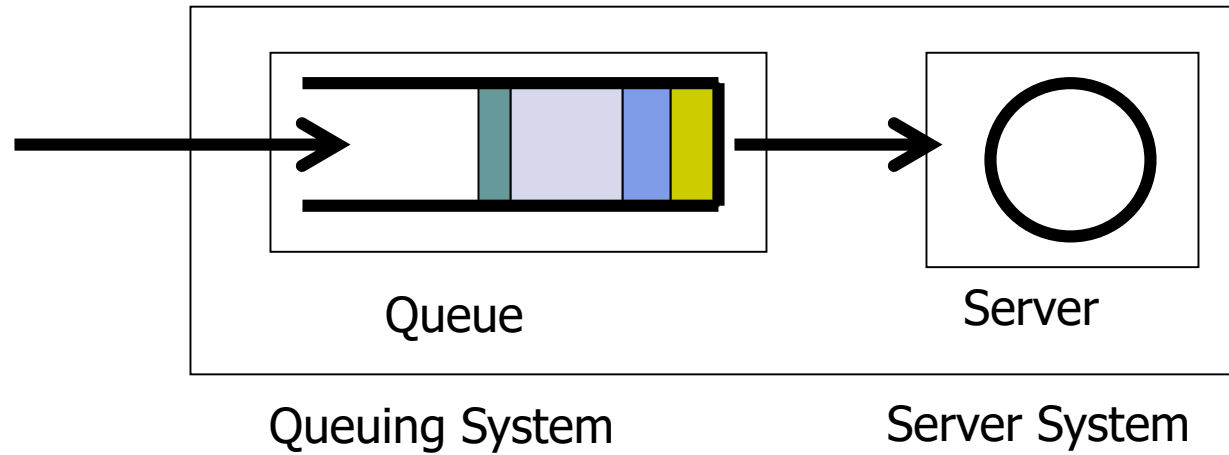Munadil K. Faaeq Al-Sammarraie
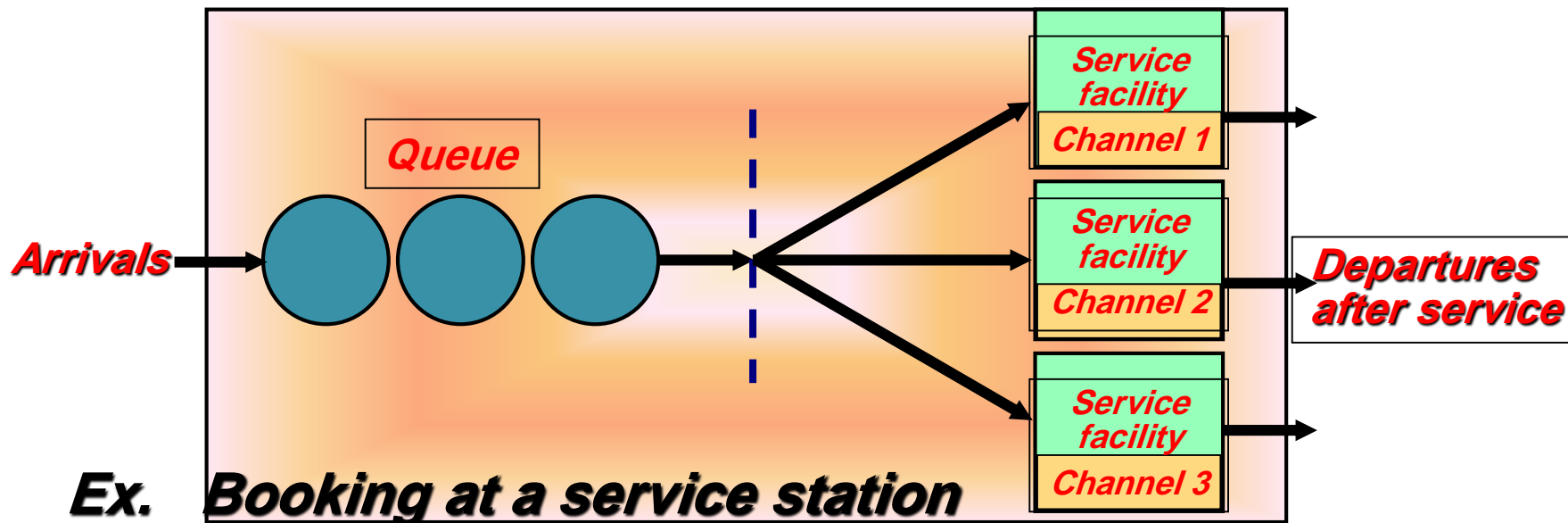Universiti Utara Malaysia, Malaysia

Queuing Theory

Service Process

Arrival Process   Queue or Waiting Line   Servers   Exit

1. A single service system

Queue   Server

Queuing System   Server System

2. Multiple, parallel server, single queue model

Queue

Arrivals

Service facility — Channel 1

Service facility — Channel 2

Service facility — Channel 3

Departures after service

Ex. Booking at a service station

3. Multiple, parallel facilities with multiple queues Model

Queues

Service station

Arrivals

Customers leave
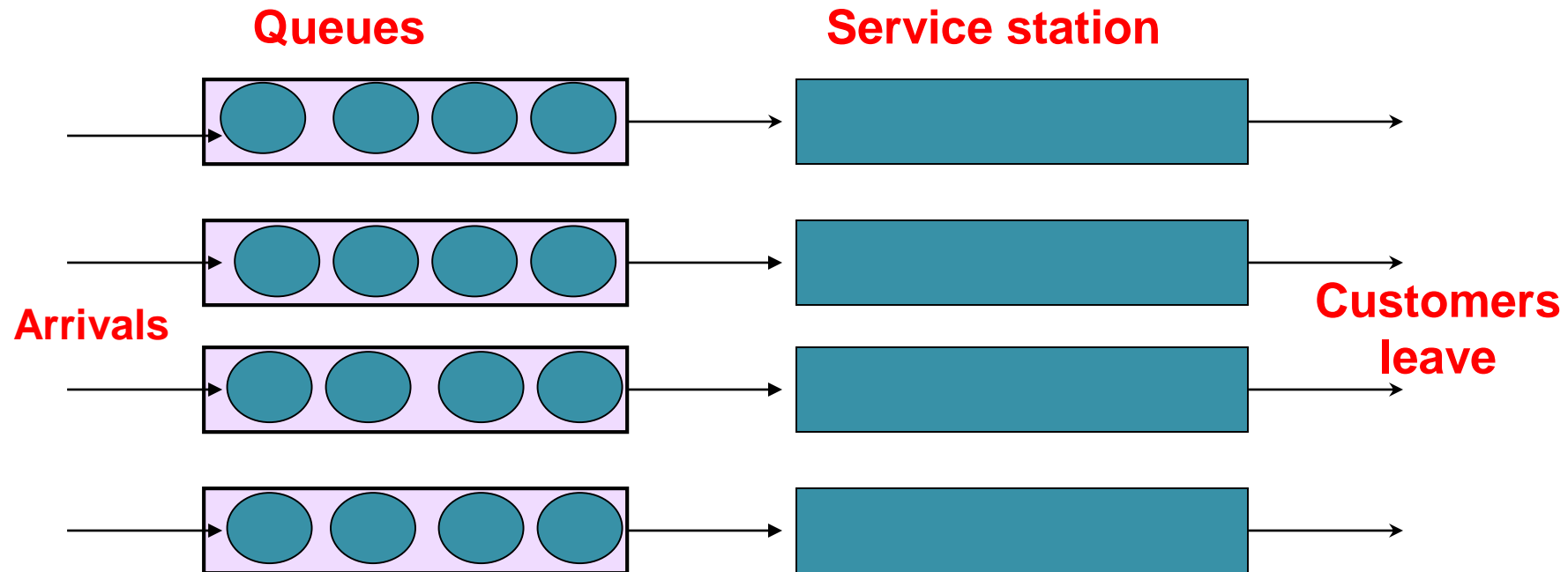
Ex. Different cash counters in electricity office

4. Service facilities in a series

Service station 1

Service station 2

| Queues | | | | Phase 1 | | Queues | | | | Phase 2 |

Queues

Queues

Customers arrival

Customers leave
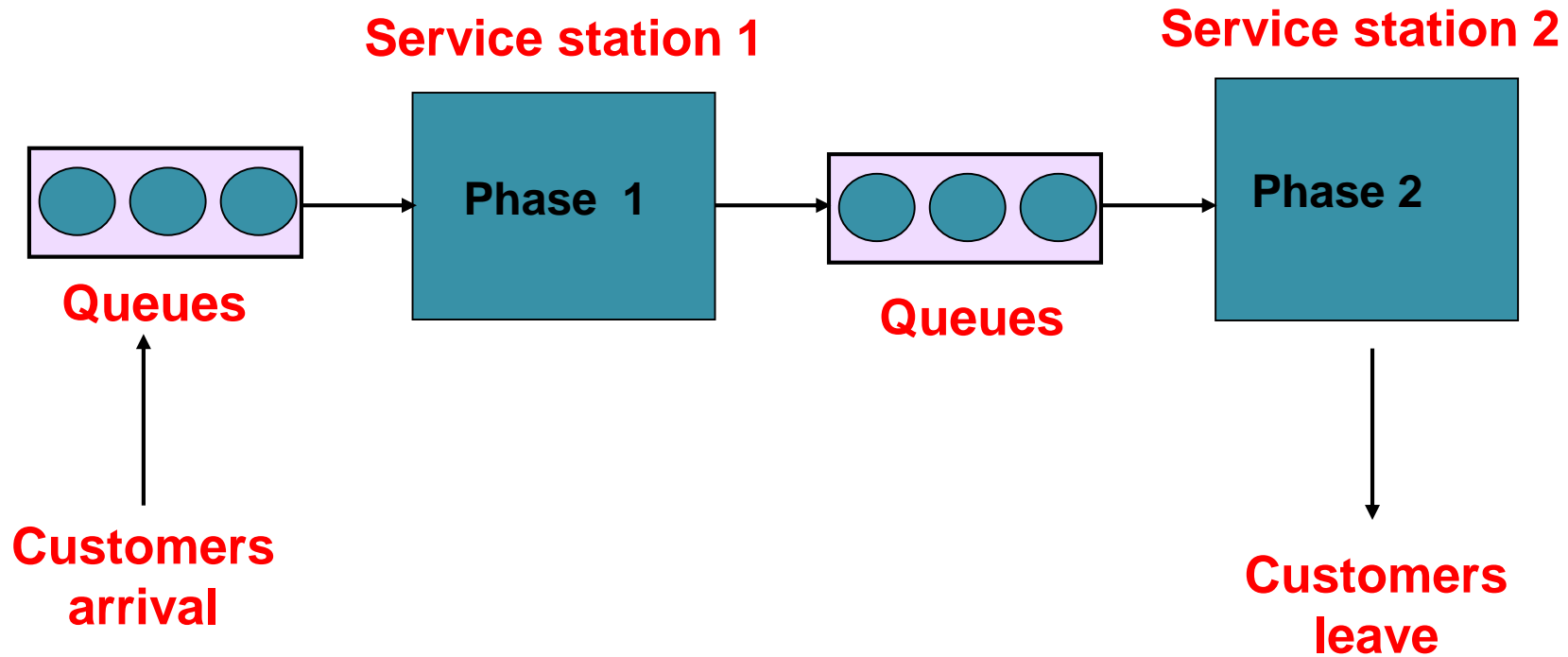
Ex. Cutting, turning, drilling, grinding, packaging operation of steel

Task Scheduling for Multiprocessor Systems Using Queuing Theory

Dr.Kusay Hameed Al-Salami[1*]   Zaid Taha Sawadi[2]
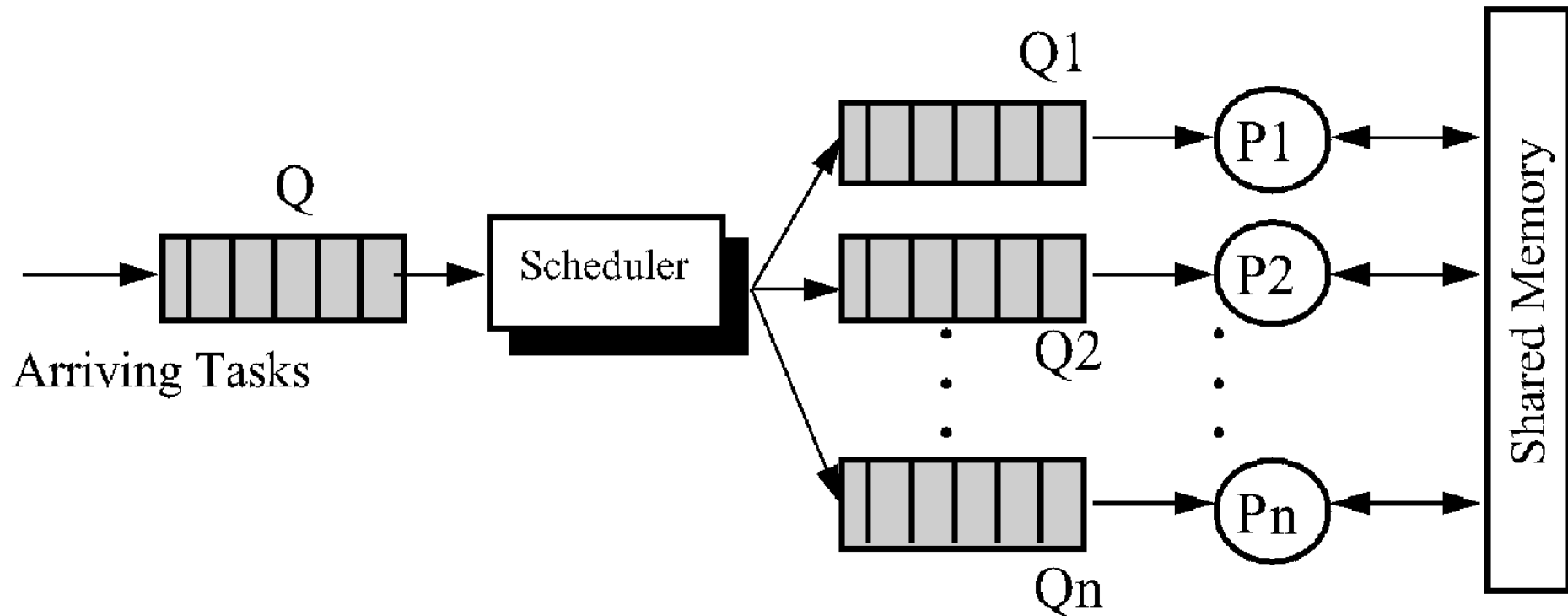
Developing New Online Multiprocessor Scheduling Algorithm using Operations Research Techniques

د.قصي حميد السلامي[1] ، أ.أحمد محمد رؤوف[2]

اجامعة جيهان ـ قسم إدارة الأعمال ـ أربيل ـ العراق.

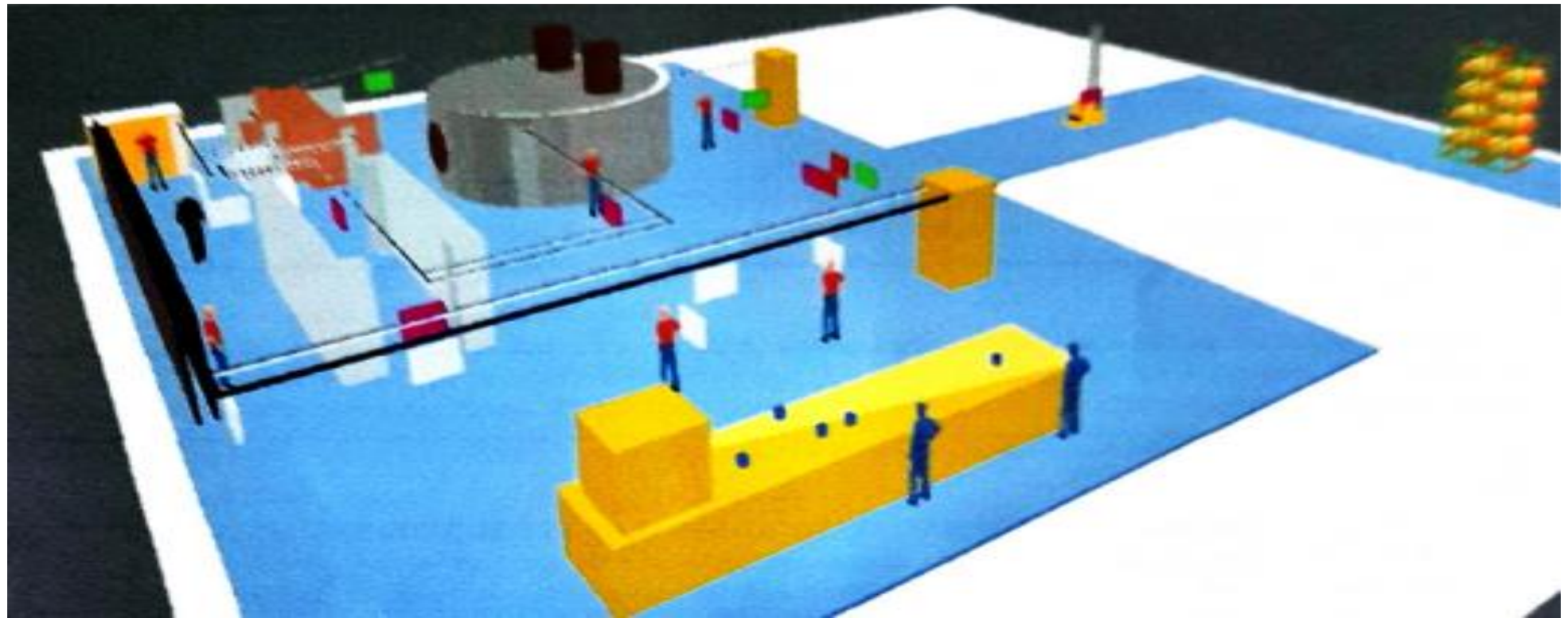اجامعة بنغازي ـ كلية تقنية المعلومات ـ قسم شبكات واتصالات الحاسوب ـ بنغازي ـ ليبيا.

Research Article

Improving Performance of Manufacturing Systems Using Simulation Technology (Powder Coating System as a Case Study)

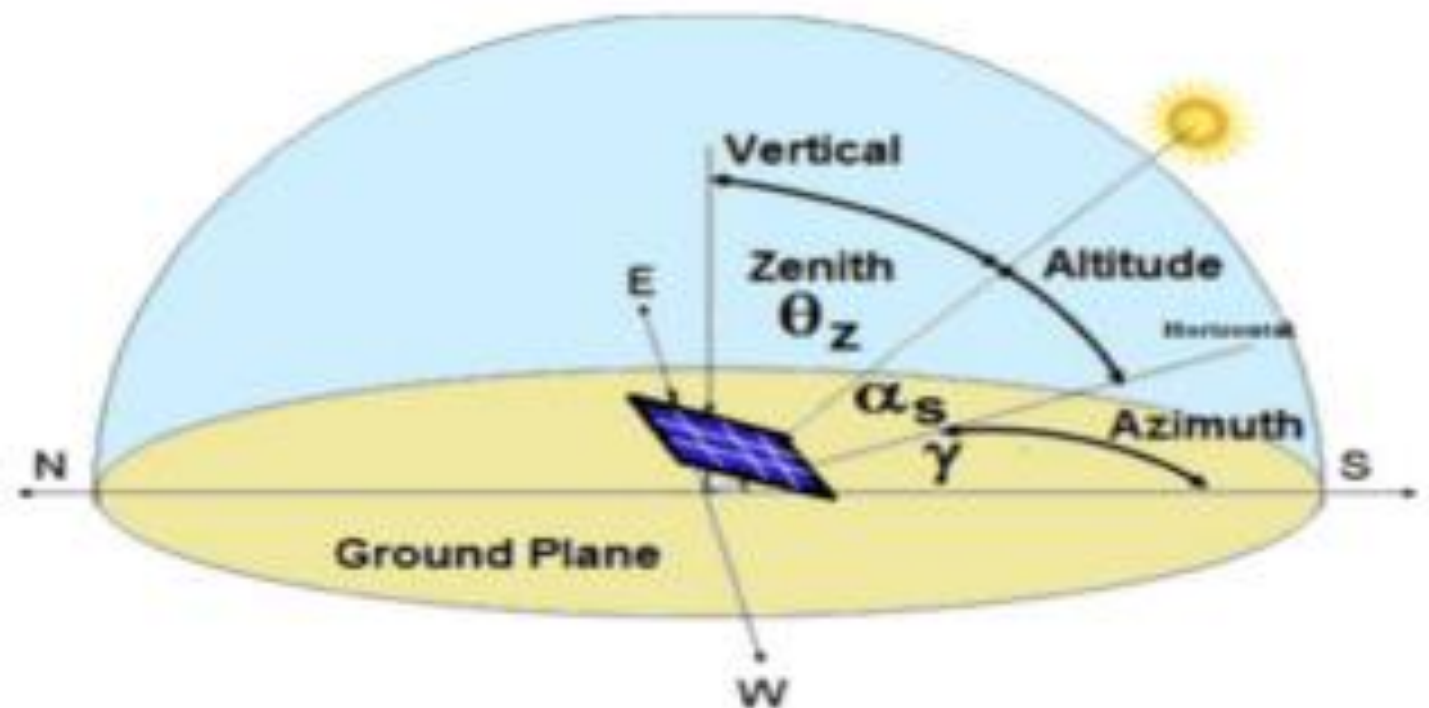Dr. Ammar Al-Bazi[a], Obiakor Tobechukwu[b] and Dr. Kusay Alsalami[c]

ORIGINAL PAPER

Calculate the best slope angle of photovoltaic panels theoretically in all cities in Turkey
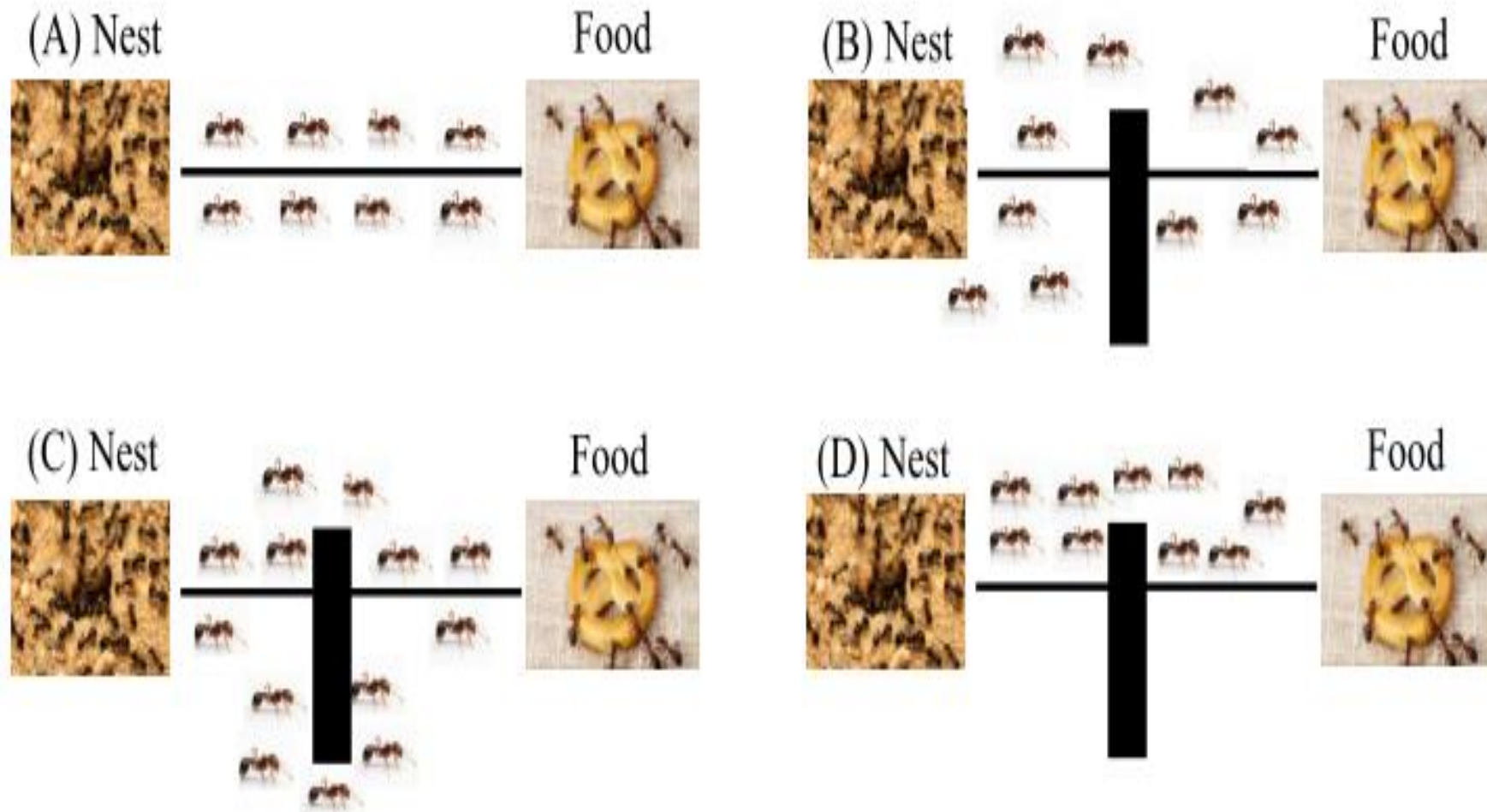
F. Abed[1] · Q. H. Al-Salami[2]

Using Ant Colony Optimization Algorithm to Find the Critical Path in Project Network Analysis
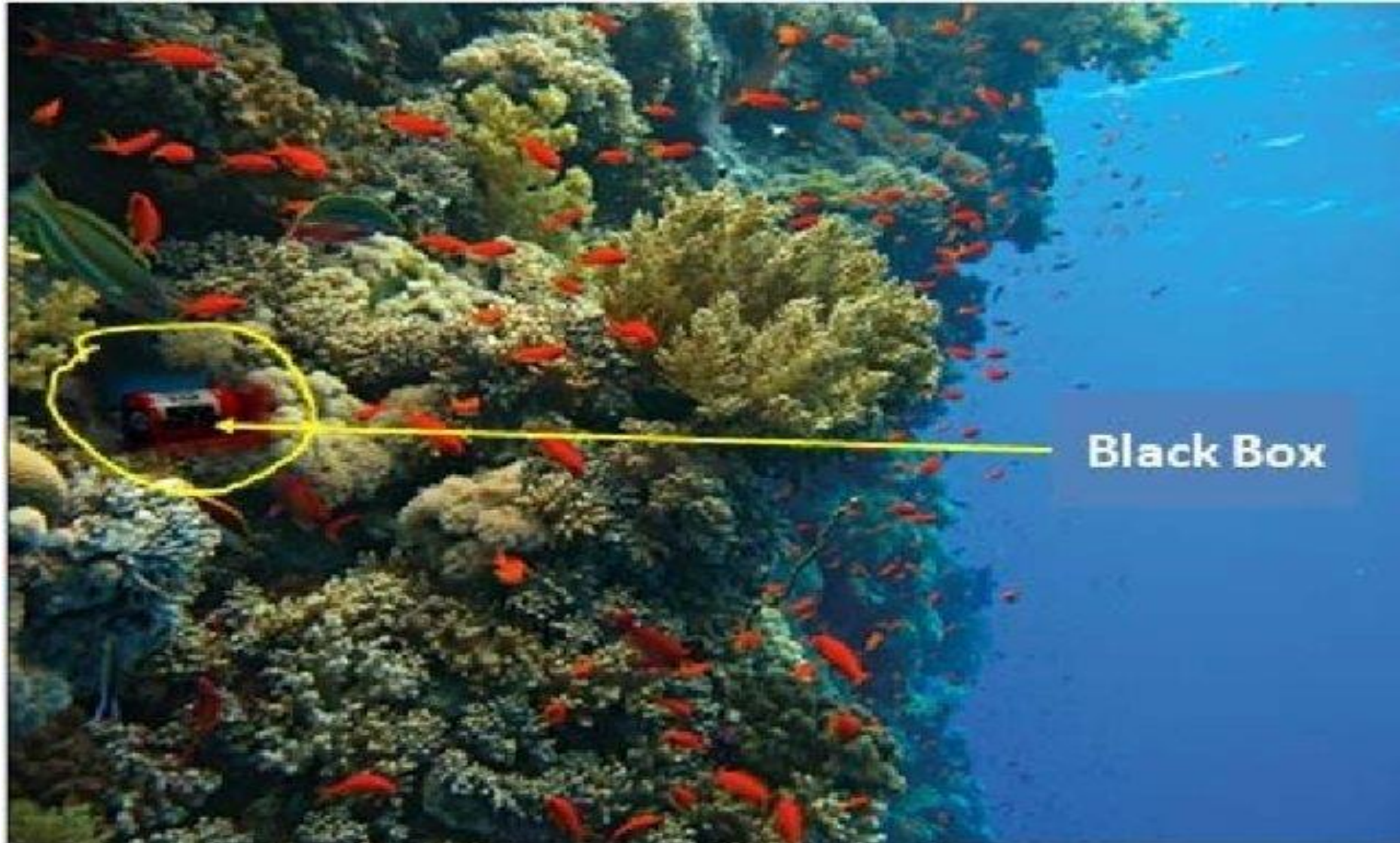

Real ants follow a path between nest and food source

Using Ant Colony Optimization Algorithm to Find the Critical Path in Project Network Analysis
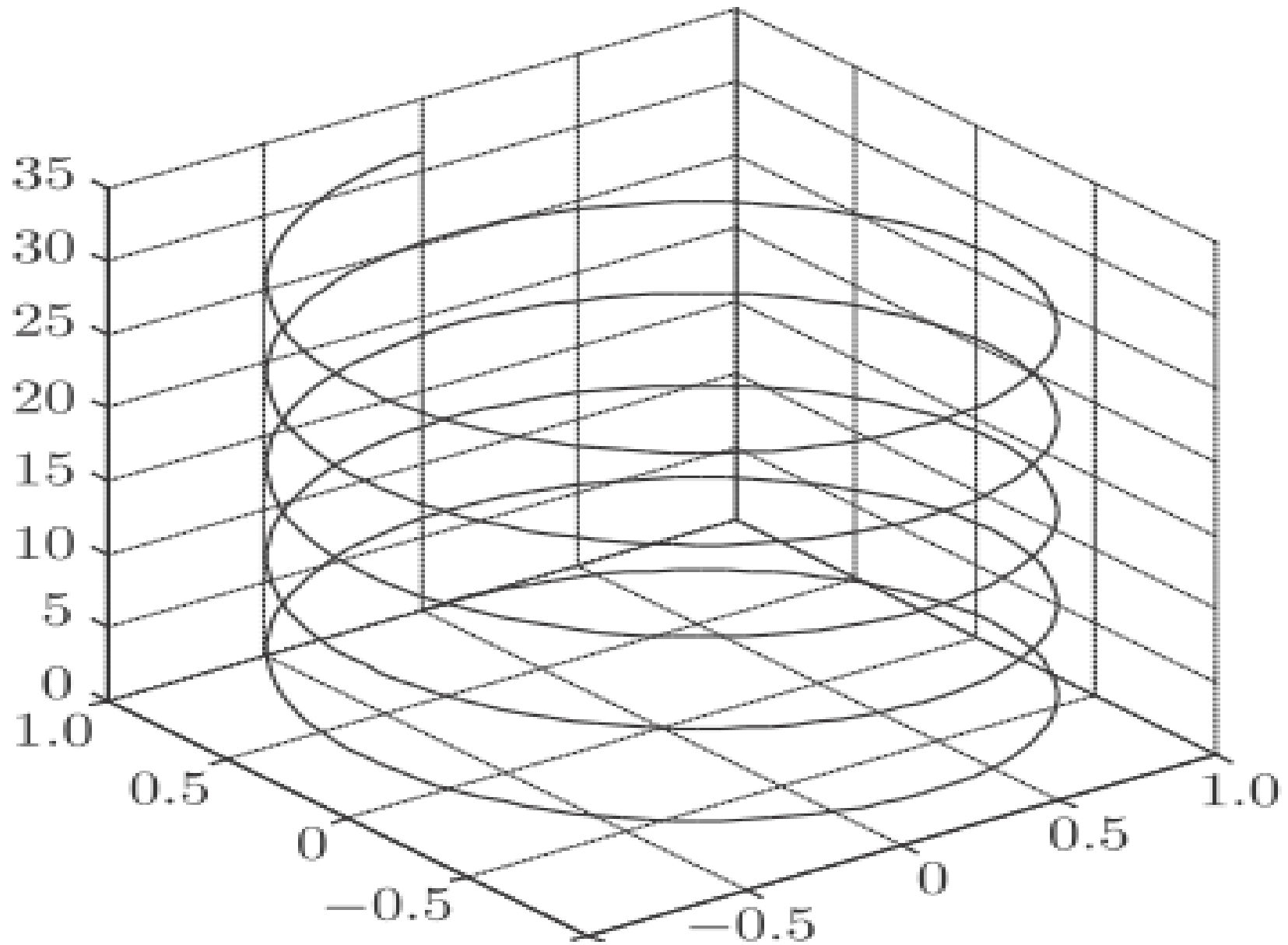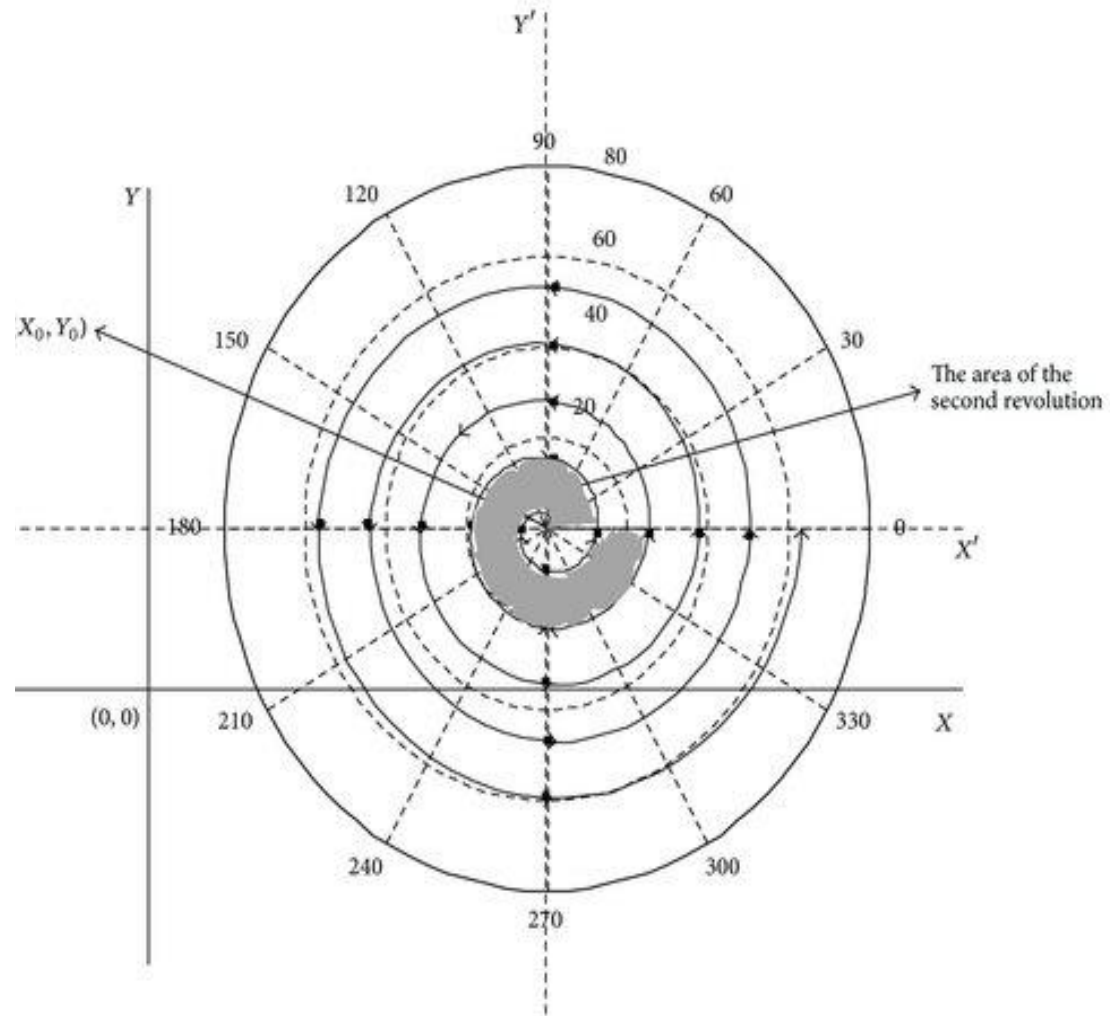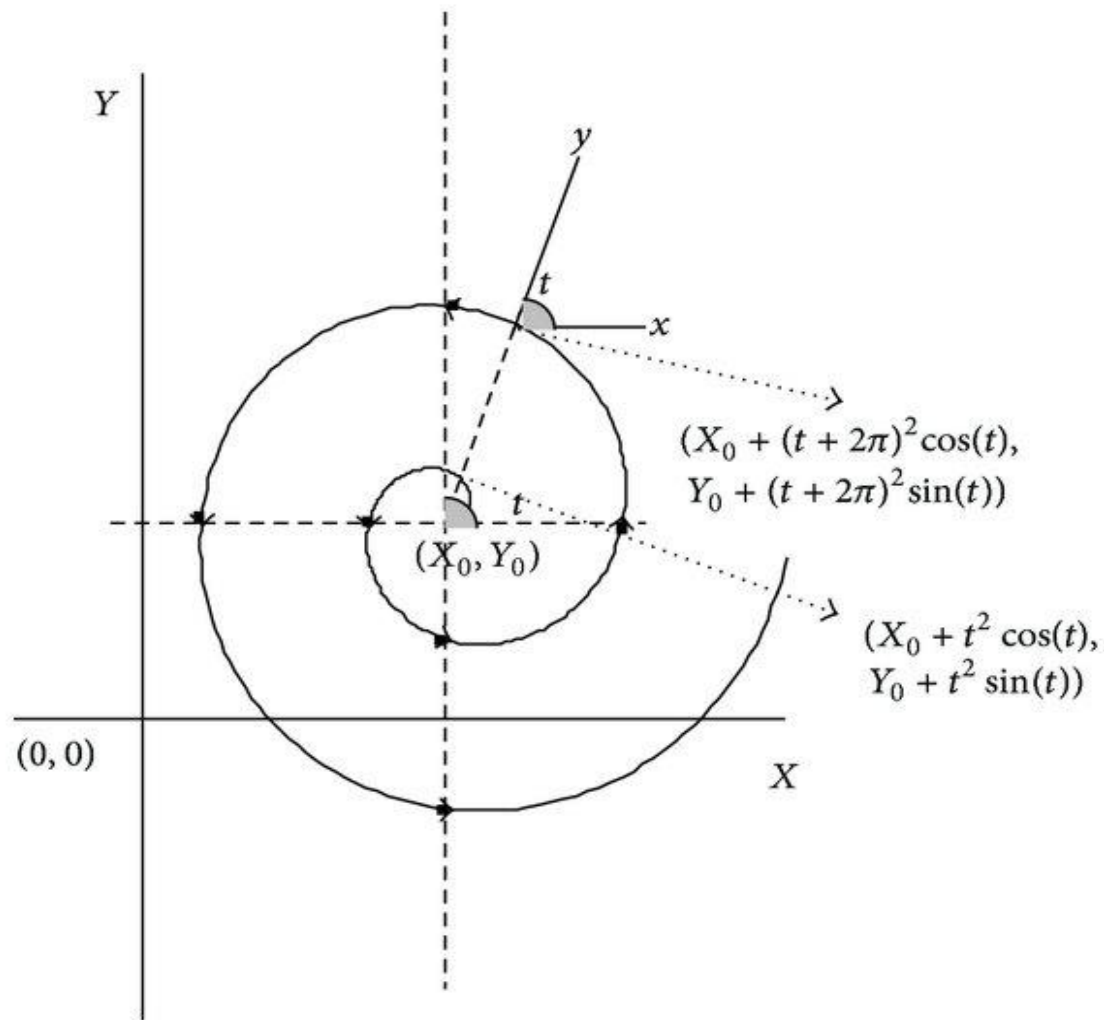
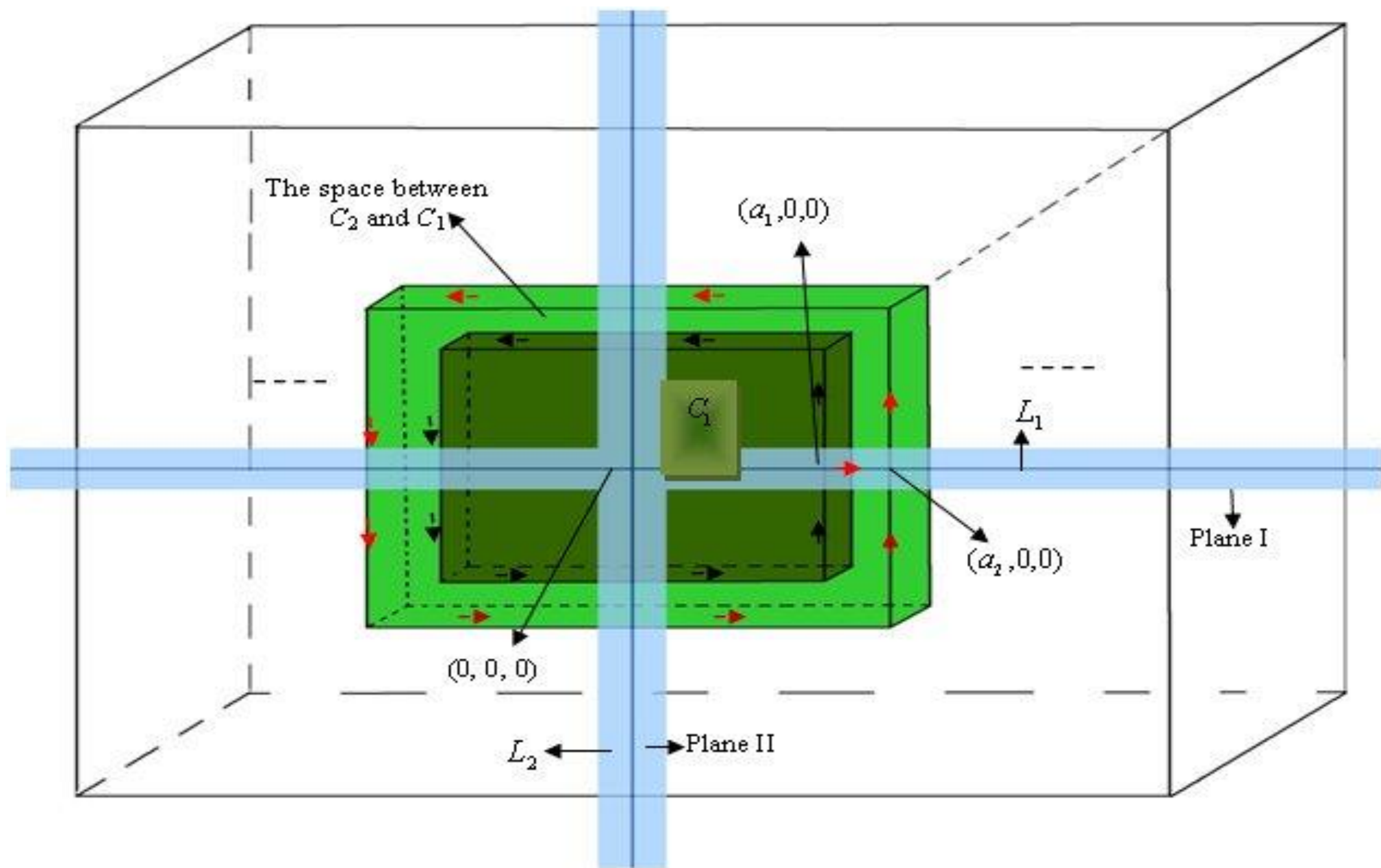# Optimal Searching for a Randomly Moving Lost Target

Black Box

Optimal Searching for a Helix Target Motion

$(X_0 + (t + 2\pi)^2 \cos(t),$
$Y_0 + (t + 2\pi)^2 \sin(t))$

$(X_0 + t^2 \cos(t),$
$Y_0 + t^2 \sin(t))$

The area of the second revolution

The space between C_2 and C_1

$(a_1, 0, 0)$

C_1

L_1

$(a_2, 0, 0)$

Plane I

$(0, 0, 0)$

L_2 ← → Plane II

Thank You For Your Attention