

**LEMBAR**  
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW**  
**KARYA ILMIAH : PROSIDING**

Judul Prosiding (Artikel) : Robust Model Predictive Control For Inventory System With Uncertain Demand Using Linear Matrix Inequalities  
 Nama/Jumlah Penulis : **Widowati**, R. Heru Tjahjana, Sutrisno, Aditya Saputra/ 4 orang  
 Status Pengusul : penulis ke- 1  
 Identitas Prosiding : a. Nama Prosiding : Journal of Physics: Conference Series  
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 c. Volume, nomor, bulan tahun : 1025 (2018) 012089  
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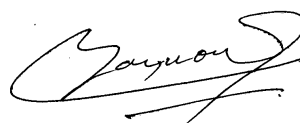
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	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2,73	3.00	2.87
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,37	6.67	7.52
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d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	8,35	7.17	7.76
<b>Total = (100%)</b>	27,80	23.51	25.66
<b>Nilai Pengusul =</b>	<b>16,68</b>	<b>14.10</b>	<b>15.39</b>

Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si  
 NIP. 196809071993031002  
 Unit kerja : Matematika FMIPA UNNES

Semarang, April 2020  
 Reviewer 1



Prof. Dr. Basuki Widodo, M.Sc  
 NIP. 19650506 1989031002  
 Unit kerja : Matematika FSAD ITS

**LEMBAR  
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b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			8,37
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			8,35
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	9,00			8,35
<b>Total = (100%)</b>	<b>30,00</b>			<b>27,80</b>

**Nilai Pengusul = 60% x 27,80 = 16,68**

**Catatan Penilaian artikel oleh Reviewer :**

**1. Kesesuaian dan kelengkapan unsur isi prosiding :**

Penulisan artikel baik dan mengikuti standard penulisan artikel di Journal of Physics: Conference Series, yaitu abstract, Introduction, Result and Discussion (IRaD), Conclusion. Belum memuat Methodology dan Acknowledgement. Artikel ini didukung dengan referensi yang sesuai.

**2. Ruang lingkup dan kedalaman pembahasan:**

Lingkup bahasan dari artikel ini adalah bidang matematika terapan, khususnya pada bidang riset operasi (pengendalian persediaan). Dalam artikel ini dibahas dengan baik tentang strategi optimal dalam pengendalian tingkat persediaan produk tunggal dari sistem persediaan dengan permintaan acak untuk meminimalkan total biaya. Relevansi hasil terkait dengan strategi optimal untuk mengendalikan sistem persediaan dengan permintaan yang tidak pasti.

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Informasi yang disajikan relatif baru dan hasil yang diperoleh memuat substansi aplikasi yang penting. Sumber gagasan penulis untuk artikel ini banyak, komprehensif dan update, yang lebih sepuluh tahun terakhir hanya 6 paper dari 15 sumber yang dirujuk. Metodologi belum disebutkan dalam artikel ini.

4. **Kelengkapan unsur dan kualitas terbitan:**

Artikel memenuhi standard penulisan dan isi untuk prosiding di Journal of Physics: Conference Series. Artikel ini terindeks di Scopus (Q3).

Surabaya, 17 April 2020

Reviewer 1



Prof. Dr. Basuki Widodo, M.Sc

NIP. 19650506 1989031002

Unit kerja : Matematika FSAD ITS

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b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			6.67
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	9,00			6.67
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	9,00			7.17
<b>Total = (100%)</b>	<b>30,00</b>			<b>23.51</b>
<b>Nilai Pengusul = 60% x23.51= 14.10</b>				

**Catatan Penilaian artikel oleh Reviewer :**

**1. Kesesuaian dan kelengkapan unsur isi prosiding:**

Kesesuaian dan kelengkapan unsur baik. Artikel terdiri atas 5 bagian: Introduction, Mathematical modeling, Linear Matrix Inequalities, Numerical simulation, Concluding Remarks. Hanya didukung 15 referensi yang Sebagian besar berupa jurnal.

**2. Ruang lingkup dan kedalaman pembahasan:**

Ruang Lingkup dan kedalaman pembahasan baik. Lingkup artikel yakni Matematika terapan sesuai dengan bidang ilmu pengusul. Interpretasi hasil simulasi kurang ditonjolkan sebagai nilai kebaruan. Pendahuluan cukup menekankan nilai lebih dari artikel ini. Pembahasan berkaitan dengan an optimal control strategy on inventory systems with uncertain demand (Terapan Matematika).

**3. Kecukupan dan kemutakhiran data/informasi dan metodologi :**

Kecukupan dan kemutakhiran data/informasi dan metodologi sudah cukup baik. Referensi ada 15 (6 jurnal diantaranya sudah lebih dari 10 tahun). Hasil yang diperoleh memuat substansi kebaruan yang penting.

4. **Kelengkapan unsur dan kualitas terbitan:**

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Semarang, April 2020  
Reviewer 2



Prof. Dr. St. Budi Waluya, M.Si  
NIP. 196809071993031002  
Unit kerja : Matematika FMIPA UNNES



THE MINISTRY OF RESEARCH, TECHNOLOGY AND HIGHER EDUCATION  
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**FACULTY OF SCIENCE AND MATHEMATICS**



**CERTIFICATE**

Decree of Dean Number : 1440/UN7.5.8/HK/2017

This is to certify that

**Widowati**

as

**PRESENTER**

In the 7<sup>th</sup> International Seminar on New Paradigm and Innovation of Natural Science and Its Application (ISNPINSA-7) held on 17 October 2017 at Grand Gandi Hotel Semarang Indonesia

with paper entitled as follows:

**Robust Model Predictive Control for Inventory System with Uncertain Demand using Linear Matrix Inequalities**

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NIP. 196902141994032002

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Volume 1025, Issue 1, 30 May 2018, Article number 012089

7th International Seminar on New Paradigm and Innovation on Natural Sciences and Its

Application, ISNPINSA 2017; Semarang; Indonesia; 17 October 2017 through 17 October 2017;

Code 136783

## Robust model predictive control for inventory system with uncertain demand using linear matrix inequalities (Conference Paper) (Open Access)

Widowati ✉, Tjahjana, R.H., Sutrisno, Saputra, A. 👤

Department of Mathematics, Faculty of Science and Mathematics, Diponegoro University, Jl. Prof Soedarto SH, Semarang, Central Java, 50275, Indonesia

### Abstract

View references (15)

In this paper, we develop an optimal control strategy on inventory systems with uncertain demand. To deal with these uncertainties we use a synthesis of robust model predictive control with linear matrix inequalities. The goal is to minimize the difference between the prediction and the reference trajectory subject to the objective function of each period, based on the input and output constraints. Using standard techniques, the optimization problem that minimizes the difference between the prediction and the reference trajectory, is reduced to a convex optimization problem involving linear matrix inequalities (LMIs). We provide numerical simulations on this system using MATLAB and then observe how robust predictive control models produce optimized strategy at the inventory level. In the simulation results, robust predictive control models provide an optimal strategy for controlling inventory levels with minimum total cost and inventory levels following inventory levels on issues. © Published under licence by IOP Publishing Ltd.

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Topic: Inventory control | Inventory | Optimal policies

Prominence percentile: 85.301 ⓘ

### Author keywords

convex optimization inventory optimal strategy linear matrix inequalities uncertain demand

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Engineering controlled terms:

Convex optimization Inventory control MATLAB Model predictive control Navigation  
Optimal control systems Robust control

Engineering uncontrolled terms

Convex optimization problems Input and output constraints Linear Matrix Inequalities (LMIs)  
Optimal control strategy Optimal strategies Robust model predictive control  
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## PREFACE

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The scope of the field of participants comes from various fields including biology, physics, chemistry, statistics, mathematics, informatics, environment, public health, and relevant fields that contribute to sustainable development. The conference was held in Semarang, Indonesia on October, 17th, 2017. There were **three keynote speakers** and **three invited speaker** who came from **Japan, Italy, Malaysia, Philipines** and **Indonesia**. The number of participants of this seminar were more than 200 consist of researchers, lecturers, postgraduate and undergraduate students from various universities and after the selection process there are 132 articles selected to be published in the present conference proceeding.

The Editors

Dr. Budi Warsito

Sapto Purnomo Putro, Ph.D.

Ali Khumaeni, Ph.D.



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Prof. Dr. Norsarahaida Saidina Amin	Universiti Teknologi <b>Malaysia</b>
Mario Rosario Guarracino, PhD.	Instituto di Calcolo e Reti ad Alte Prestazioni- National Research Council (ICAR-CNR), <b>Italy</b>
Dr. dr. Budi Wiweko, Sp. OG-KFER.	University of Indonesia, Jakarta

### Invited Speaker:

Prof. Elmer S. Estacio, PhD.	National Institute of Physics, University of the <b>Philippines</b> , Manila,
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# Palatal rugae comparison between ethnic Javanese and non-Javanese

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**Abstract.** Palatal rugae patterns are thought to remain unchanged from the beginning of formation until the death of the individual, and as unique as fingerprints. This study aimed to compare palatal rugae between ethnic Javanese and non-Javanese in Indonesia. The study sample consisted of maxillary casts from 47 Javanese and 53 non-Javanese subjects. The patterns of palatal rugae were recorded based on the Thomas and Kotze classification. In the results, the only variable with indicated significant difference between the sample populations was observed in the lower frequency of circular shape rugae for the non-Javanese group. The value of this frequency as a population-level indicator is reduced by the relative rarity of this rugae shape.

**Keyword:** Palatal rugae, rugoscopy, forensic odontology, ethnic difference

## 1. Introduction

Palatal rugae are located on the anterior part of the palatum mucosa that spreads in both sides of the palate, behind the papillary insisve [1,2]. The unique pattern of human palatal rugae allows for the use of these patterns in identification of individuals [3]. Palatal rugae patterns are formed in the third month of intrauterine development [4].

The function of palatal rugae is to prevent food from coming out from the mouth, help in mastication process, and to participate in talking and sucking in children. The palatal rugae also play a role in the perception of taste and food texture due to the presence of gustatory and tactile receptors. Palatal rugae have good resistance to changes by disease, physical trauma, thermal insult, decomposition or chemicals because the palatal rugae are protected by lips, cheeks, and teeth [1]. In the case of corpse decomposition, palatal rugae resist post mortem decomposition up to 7 days after death [5].

In the process of individual identification, it may happen that primary identification methods such as analysis of fingerprints, DNA and dental records cannot be used when the victim's body is badly burned and jaws are edentulous. Then alternative methods, like palatal rugae analysis, could help [6]. Apart from each individual having a different palatal rugae morphology, the process of analysis and identification carries low cost [7]. Tooth eruption and tooth extraction have generally no effect on the pattern or position of palatal rugae, although sometimes the rugae close to the alveolar arch may shift position after tooth extraction [8]. The palatal rugae pattern may also change under some conditions such as finger sucking habits in children, and pressure by orthodontic treatment [9]. The present study aims to compare palatal rugae between ethnic Javanese and non-Javanese in Indonesia.





## The impact of ozonated water treatment on growth rate of ‘Srikandi’ tilapia (*Oreochromis Aureus X Niloticus*)

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**Abstract.** The impact of ozonized water treatment on ‘Srikandi’ tilapia was assessed using ozone reactor with an airflow velocity of 1.5 L / min at a voltage of 10 kV, which leads to that the dissolved oxygen (DO) content increases from 0.99 to 11.11 mg / L. The ozonized water treatment was divided into five groups based on the length of treatment period: 5 minutes as group I, 10 minutes as group II, 15 minutes as group III, 20 minutes as group IV and 0 minute (Reference case). The fish growth rate was measured in terms of length and weight per seven days for 30 days. The result indicated that the fastest growth rate of ‘Srikandi’ tilapia occurred at the group III (length growth: 7.82 cm; weight growth: 7.72 g in 30 days). The fastest Specific Growth Rate (SGR) of the fish occurred at the group II (1.281%), and the fastest Relative Growth Rate (RGR) of the fish occurs at the group III (4.538%). The oxygen content, temperature, salinity to match the growth of Tilapia ‘Srikandi’ are vital elements in Tilapia farming management. These results are considered to be useful to increase the production rate of ‘Srikandi’ tilapia farming.

### 1. Introduction

Salt water pond-fish farming in coastal areas has following advantages than the corresponding fresh water pond-fish farming i.e. high tolerance of salinity up to 30 ppt with survival rate >80%, rapid growth (can reach 200 grams in three months with salinity pressure), high protein contain as a food source of animal protein, high content of omega 3(reach >105 mg/100 g meat) and omega 6 (reach >230 mg/100g of meats ) fatty acids, has a better meat taste and chewy meat texture, and can grow up in polyculture system [1]. Aquaculture can be defined as human efforts to increase the water productivity through aquatic farming of aquatic biotas. Aquaculture is a breeding activity to gain benefits via reproduction, growth, and aquatic organism quality increase In line with the increase demand of seafood production around the world, a productive aquaculture is urgently needed to produce organisms in controlled environment and subsequently to gain profit [2].

Tilapia is cultivated in fresh water commodity in hatchery and enlargement because of it benefits that can be compared with some fresh water fishes, especially in rapid growth, easy to breed, easy in maintenance process, and high adaptation in environment changes [3]. Tilapia habitat originates in fresh water of rivers, lakes, stanks, and swamps, but can tolerate in large salinity (eury haline) so that it can live in brackish water and salt water of ocean. The fish tolerant availability of salinity is 0-35 ppt



# Lipid production from tapioca wastewater by culture of *Scenedesmus sp.* with simultaneous BOD, COD and nitrogen removal

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**Abstract.** The use of microalgae to produce biodiesel or possibly remove nutrients from industrial wastewater has gained important attention during recent years due to their photosynthetic rate and its versatile nature to grow in various wastewater systems. In this study, a microalgae, *Scenedesmus sp.*, was cultured to enhance the lipid production and nutrients removal from tapioca wastewater sample. To assess lipid production, *Scenedesmus sp.* was cultured in different concentration of tapioca wastewater sample (from 0 to 100 %), and nutrient removal including BOD, COD, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub> level by *Scenedesmus sp.* was assessed in 100% of tapioca wastewater culture. After 8 days of culture, it was found out that 50% of tapioca wastewater sample resulted in highest concentration of lipid content than that of the other concentrations. The level of environment indicator as nutrient removal such as BOD, COD, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub> were also decreased up to 74%, 72%, 95%, 91%, and 91%, respectively. The pH condition changed from initial condition acidic (pH: 4) to neutral or basic condition (pH: 7-8) as recommended in wastewater treatment system. This research provided a novel approach and achieved efficient simultaneous lipid production and nutrients removal from tapioca wastewater sample by *Scenedesmus*'s culture system.

**Keyword:** *Scenedesmus sp.*, tapioca wastewater, lipid production

## 1. Introduction

The energy crisis is one of the most important problems faced by all people over the world in the 21st century. The highest consumption of fossil fuels has result in greenhouse effect and causes global climate change [1,2]. One of a type of renewable energy is microalgae biomass-based biofuel, which is considered as one of the most potent substitutes for fossil fuel [2]. However, to increase the production of microalgae biomass, several strategies should be developed, such as modification of culture medium and environmental factors. Hence, one of promising strategies is using wastewater sample as

