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

Judul Prosiding (Artikel) : Optimal Strategy Analysis Based on Robust Predictive Control for Inventory System with Random Demand

Nama/Jumlah Penulis : Aditya Saputra, **Widowati**, Sutrisno / 3 orang

Status Pengusul : penulis ke- 2

Identitas Prosiding :
a. Nama Prosiding : AIP Conference Proceedings
b. Nomor ISSN : 00001984, 00002005, 00001983
c. Volume, nomor, bulan tahun : **1913**, 020017 (2017)
d. Penerbit : AIP Publishing
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Kategori Publikasi Prosiding (beri ✓pada kategori yang tepat) :
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b. Ruang lingkup dan kedalaman pembahasan (30%)	8,38	8.00	8.19
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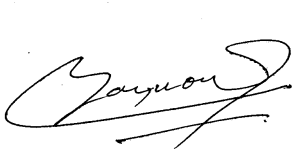
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	8,10	8.50	8.30
Total = (100%)	27,43	27.50	27.47
Nilai Pengusul = 40% x1/2	**5,49**	**5.50**	**5.49**

Semarang, April 2020

Reviewer 2

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

Reviewer 1



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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
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a. Kelengkapan unsur isi prosiding (10%)	3,00			2,70
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			8,38
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9,00			8,25
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	9,00			8,10
Total = (100%)	**30,00**			27,43
Nilai Pengusul = 40% x1/2x 27,43 = 5,49				

Catatan Penilaian artikel oleh Reviewer :

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

Penulisan artikel baik dan mengikuti standard penulisan artikel di AIP Conference Proceedings, 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 pemrograman dinamis. Dalam artikel ini dibahas dengan baik tentang strategi optimal untuk mengendalikan tingkat persediaan dari sistem persediaan produk tunggal dengan permintaan acak sehingga total biaya minimal. Strategi optimal dihitung menggunakan model kontrol prediktif model yang robust. Relevansi hasil terkait dengan strategi optimal meminimumkan total biaya didalam mengendalikan sistem persediaan produk tunggal multi-periode dengan permintaan tidak pasti.

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

Informasi yang disajikan cukup baru dan hasil yang diperoleh memuat substansi orisinil dengan aspek aplikasi yang penting Sumber gagasan penulis untuk artikel ini banyak, komprehensif dan update, yang lebih sepuluh tahun terakhir hanya 5 paper dari 13 sumber yang dirujuk. Methodologi belum disebutkan dalam artikel ini.

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

Artikel memenuhi standard penulisan dan isi untuk AIP Conference Proceedings. Artikel ini diterbitkan tahun 2017 di AIP Conference Proceedings yang terindeks di Scopus.

Surabaya, 17 April 2020
Reviewer 1

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a. Kelengkapan unsur isi prosiding (10%)	3,00			3.00
b. Ruang lingkup dan kedalaman pembahasan (30%)	9,00			8.00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9,00			8.00
d. Kelengkapan unsur dan kualitas terbitan/prosiding (30%)	9,00			8.50
Total = (100%)	**30,00**			27.50
Nilai Pengusul = 40% x1/2x27.50=5.50				

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

Kesesuaian dan kelengkapan unsur isi baik. Artikel tersusun dalam kaidah penuliasan karta ilmiah. Terdiri atas 4 bagian: Introduction, Mathematical model, Numerical simulation, Concluding Remarks. Didukung 13 referensi Sebagian besar jurnal.

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

Ruang lingkup dan kedalaman pembahasan cukup baik. Interpretasi hasil kurang ditonjolkan nilai temuan kebaruan terutama interpretasi gambar. Pembahasan mengenai the robust model predictive control is used to determine the optimal strategy for controlling the single product multi-period inventory system with uncertain demand. Termasuk Matematika Terapan yang sesuai dengan bidang keilmuan pengusul.

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

Kecukupan dan kemutakhiran data/informasi dan metodologi baik. Terdapat 13 referensi Sebagian besar berupa jurnal (4 referensi kurang up to date). Metodologi cukup baik.

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

Kelengkapan unsur dan kualitas terbitan cukup baik. Artikel diterbitakan dalam AIP Conference Proceedings Penerbit AIP Publishing. Terindeks di Scopus: SJR 0.165 (2017). Hasil Turnitin similarity index sebesar 12%. Beberapa editorial kurang dilakukan dengan teliti.

Semarang, April 2020

Reviewer 2

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ICWOMAA 2017
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This certificate is awarded to

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Optimal Strategy Analysis Based on Robust Predictive Control for Inventory System with Random Demand

at **International Conference and Workshop on Mathematical Analysis and Its Applications**
on 31 July - 3 August 2017 at Brawijaya University Malang

Malang, 2 August 2017

Prof. Dr. Ir. Mohammad Bisri, M.S
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AIP Conference Proceedings
Volume 1913, 5 December 2017, Article number 020017
International Conference and Workshop on Mathematical Analysis and its Applications,
ICWOMAA 2017; Brawijaya UniversityMalang; Indonesia; 2 August 2017 through 3 August 2017;
Code 132514

Optimal strategy analysis based on robust predictive control for inventory system with random demand (Conference Paper) (Open Access)

Saputra, A., Widowati, Sutrisno

Department of Mathematics, Diponegoro University, Semarang, Indonesia

Abstract

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In this paper, the optimal strategy for a single product single supplier inventory system with random demand is analyzed by using robust predictive control with additive random parameter. We formulate the dynamical system of this system as a linear state space with additive random parameter. To determine and analyze the optimal strategy for the given inventory system, we use robust predictive control approach which gives the optimal strategy i.e. the optimal product volume that should be purchased from the supplier for each time period so that the expected cost is minimal. A numerical simulation is performed with some generated random inventory data. We simulate in MATLAB software where the inventory level must be controlled as close as possible to a set point decided by us. From the results, robust predictive control model provides the optimal strategy i.e. the optimal product volume that should be purchased and the inventory level was followed the given set point. © 2017 Author(s).

SciVal Topic Prominence

Topic: Inventory control | Inventory | Optimal policies

Prominence percentile: 85.301

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Original language: English

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Volume Editors: Kilicman A.,Marjono,Wibowo R.B.E.,Imron M.A.
Sponsors:
Publisher: American Institute of Physics Inc.

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(2011) *Logistics and Supply Chain Management*. Cited 234 times.
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Hakim, D.U.H.E. , Sutrisno , Widowati
(2019) Journal of Physics: Conference Series

Stock Control of Single Product Inventory System with Imperfect Delivery by Using Robust Linear Quadratic Regulator

Luthfi, M.F. , Sutrisno , Widowati
(2018) Proceedings - 2018 4th International Conference on Science and Technology, ICST 2018

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Preface: International Conference and Workshop on Mathematical Analysis and its Applications (ICWOMAA) 2017

The papers were presented at the International Conference and Workshop on Mathematical Analysis and its Applications (**ICWOMAA**) 2017, which took place in Brawijaya University, Malang, Indonesia on August 2-3, 2017. These papers represent current important work in the field of mathematical analysis and its applications, which categorized into Real Analysis, Complex Analysis, Operator Theory, Integral Theory, and Applied Analysis in other fields. In general, we selected 38 papers of 60 submitted papers. Some of the presenters did not submit their papers; they only present their results in the conference. The total presenters were 98 persons from various countries.

The conference has discussed ongoing and updated researches on mathematical analysis and related subjects, including educational mathematics to foster growth in our community. During the conference, significant discussion time followed each presentation to allow for feedback and suggestions for future directions of the researches. Hopefully, participants have had used those opportunity to expand their networks and to share their ideas throughout the interaction.

Above all, we would like to express our sincere thanks to the Steering and Organizing Committees; Associate Prof. Karel Svadlenka, Ph.D (Kyoto University, Japan), Prof. Dr. Hendra Gunawan (Bandung Institute of Technology, Indonesia), Prof. Dr. Supama, M.Si. (Gadjah Mada University, Indonesia), Prof. Dr. Agus Suryanto, M.Sc (Brawijaya University, Indonesia), Dr. Eridani, M.Si (Airlangga University, Indonesia), Dr. Dieky A, M.Si (Sepuluh Nopember Institute of Technology, Indonesia), Prof. Dr. Mustafa Bayram (Istanbul Gelisim University, Turkey), Prof. Dr. Aydin Secer (Yildiz Technical University, Turkey), and Prof. Dr. Mokhtar Kirane (Universit'e de La Rochelle, France). Most importantly, we also wish to acknowledge the conference reviewers and all authors for their excellent work and contributions without whose expert input this event would not have been possible.

Finally, we are grateful for the support by the Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University. We also extend our thanks to all members of Komunitas Analisis Matematika Indonesia (KAMINDO) for their support and participation in this conference.

Editors,

Prof. Dr. Adem Kilicman
Ratno Bagus Edy Wibowo, Ph.D
Prof. Dr. Marjono, M.Phil
Dr. Moch. Aruman Imron, M.Si

International Conference and Workshop on Mathematical Analysis and its Applications (ICWOMAA 2017)
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Aditya Saputra, Widowati and Sutrisno

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Anna Silvia Purnomo, Isnani Darti and Agus Suryanto

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ARTICLES

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Existence of global weak solutions for Cauchy-Dirichlet problem for evolutional *p*-Laplacian systems

Corina Karim and Masashi Misawa

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Numerical method for the simulation of contact angle dynamics

Nur Shofianah, Karel Svadlenka and Rhudaina Z. Mohammad

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Errors Analysis of Problem Solving Using The Newman Stage After Applying Cooperative Learning of TTW Type

Rr Chusnul C[1, a)] Mardiyana[2, b)] Dewi Retno S[3, c)]

[1,2] *Department of Mathemathics Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta 57126, Indonesia*

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Abstract. Problem solving is the basis of mathematics learning. Problem solving teaches us to clarify an issue coherently in order to avoid misunderstanding information. Sometimes there may be mistakes in problem solving due to misunderstanding the issue, choosing a wrong concept or misapplied concept. The problem-solving test was carried out after students were given treatment on learning by using cooperative learning of TTW type. The purpose of this study was to elucidate student problem regarding to problem solving errors after learning by using cooperative learning of TTW type. Newman stages were used to identify problem solving errors in this study. The new research used a descriptive method to find out problem solving errors in students. The subject in this study were students of Vocational Senior High School (SMK) in 10th grade. Test and interview was conducted for data collection. Thus, the results of this study suggested problem solving errors in students after learning by using cooperative learning of TTW type for Newman stages.

INTRODUCTION

Mathematics is a compulsory subject at the school level, evident at every level of mathematics course. Mathematics has an important role in the mastery of science and technology. According to Leonard in [1] mathematics knowledge and skill provide a key for entry into rapidly changing technological world. This is because mathematics as the basis of other knowledge, mathematics is also closely related to everyday life. Everyday activities that we live are closely related to math. There are many mathematical reasons. One reason is that students are expected to have the ability and skills in solving problems.

Problem solving is essential in learning math. Problem solving drill students to work out the problem systematically. According to Okur in [2] problem solving is a way of thinking, reasoning and using the things learned in all the math activities. To solve the problem, in solving the problem requires knowledge that has been obtained before. Problem solving as a process, an activity that is more about important procedure steps, strategies and characteristics that are taken to resolve the so that students can find answers to question and not just the answer it self [3].

Problem Solving has 4 steps to solve the problem at hand. According to Polya, stages to solve problems are understand the problem, make a plan, carry out the plan, and look back at the complete solution [4]. In step understand the problem, students are expected to know the information contained in the problem and the desired question. In step make a plan, students are expected to find the formula that will used to solve the problem. In the carry out the plan, students are expected to be thorough in calculating the settlement. According Miller, in this process the teacher can promote the use of different problem solving strategies [5]. In step look back at the complete

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Numerical Method for The Simulation of Contact Angle Dynamics

Nur Shofianah[1,a)], Karel Svadlenka[2,b)] and Rhudaina Z. Mohammad[3,c)]

[1]*Department of Mathematics, Faculty of Mathematics and Natural Science, Brawijaya University, Malang, Indonesia*
[2]*Department of Mathematics, Graduate School of Science, Kyoto University, Kyoto, Japan*
[3]*Mathematics and Statistics Department, Western Mindanao State University, Philippines*

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[c)]rhudaina@gmail.com

Abstract. In this research, we develop a method to simulate nonsymmetric triple junction motion given by the gradient flow of surface energy with arbitrary surface tensions of the participating interfaces. The foundation of the method is the diffusion-based BMO algorithm in vector-valued formulation. We realize the nonsymmetric motion by generalizing the original BMO method and adding a corrective projection step. In the end, we show the numerical example for the simulation of the bubble motion using two different contact angles to simulate the contact angle dynamics.

INTRODUCTION

Understanding the contact angle dynamics is very useful to realize some kinds of important phenomena. An example of such phenomena is the motion of small droplets or bubbles which has important applications in nanotechnology and heat transfer.

In this research, we develop an interface model with contact angle. The interface between two fluids is considered as a membrane with its own physical parameters. We build an interface model based on gradient flow of surface energy and develop a numerical model for interface motion with arbitrary surface tensions leading to nonsymmetric triple junctions. To treat such curvature-dependent motions, several methods have been developed. For symmetric junctions, Merriman, Bence and Osher [1] introduced the BMO method, which alternately diffuses and sharpens characteristic function for each phase region. Ruuth [2] generalized the BMO method to nonsymmetric triple junctions by replacing the thresholding step with a new decision using a projection triangle. Svadlenka et al. [3] reformulated the BMO algorithm in a vector-valued setting for multiphase motion. This vector-valued formulation is essential for implementing constraints and for dealing with more general motions. However, it is restricted to the symmetric case. Mohammad et al. [4] improved the symmetric multiphase BMO algorithm of [3] by introducing a vector-valued signed distance function.

In this work, we consider three evolving curves meeting at a junction and having arbitrary surface tensions. We achieve the simulation of such a triple junction by generalizing the two main ingredients of the method in [3]: the reference vectors (corresponding to the positions of wells in the phase-field method) and the way of diffusing. Moreover, we improve the scheme by including a modification of the projection step in [2]. The developed method is applicable to constrained motions, which is essential for the considered coupled model. The contact angle dynamics have been analyzed using interface-fluid coupled model that have been developed in [5, 6].

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Existence of Global Weak Solutions for Cauchy-Dirichlet Problem for Evolutional p-Laplacian Systems

Corina Karim[1,a)] and Masashi Misawa[2,b)]

[1]*Department of Mathematics, Faculty of Mathematics and Natural Sciences, Brawijaya University, Indonesia*
[2]*Department of Mathematics, Graduate School of Science and Technology, Kumamoto University, Japan*

[a)]co_mathub@ub.ac.id
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Abstract. We study the existence of global weak solutions for Cauchy-Dirichlet problem for evolutional p-Laplacian systems. The initial data is belonging to the Sobolev space $W^{1,p}(\Omega, \mathbb{R}^n)$. We use a varitional (like) method to treat the existence of a weak solution, this method seems somehow simply than the Galerkin method.

INTRODUCTION

Let Ω be a bounded domain in $\mathbb{R}^m$, $m \geq 2$, with smooth boundary $\partial\Omega$, and let $\frac{2m}{m+2} < p < \infty$. For a map $u : (0,T) \times \Omega \to \mathbb{R}^n$, $z = (t,x) = (t, x_1, x_2, ..., x_m)$, $u = u(z) = (u^1(z), ..., u^n(z))$, we consider p-Laplacian type, with principal term only, as below

$$\begin{cases} \partial_t u - \operatorname{div}(|Du|^{p-2}Du) = 0 & \text{in } (0,T) \times \Omega \\ u(0,x) = u_0(x) & \text{on } \partial_p(0,T) \times \Omega \end{cases} . \tag{1}$$

The global existence of weak solutions to the heat flow of p-harmonic maps was settled by Chen et al. ([1]) whose proof is using Galerkin method and 'monotonicity trick'. In the other hand, the existence of solution for a Cauchy-Dirichlet problem with constant coefficient and principal term only has been studied well by [4], where the proof is also using Galerkin method with the initial-boundary data is assumed to be a bounded weak solution. Our method used in this paper is different from their and we called a varitional (like) method. This method seems simple than Galerkin method. The existence itself plays important role to prove the Hölder regularity and the gradient Hölder regularity for p-Laplacian system (see [2], [3], [5], [6]).

Our main purpose of this paper is to proof the global existence of weak solution for Cauchy-Dirichlet problem for evolutional p-Laplacian systems by the Rothe type time-difference (elliptic) partial differential equation systems such that for a.e $t \in (0, \infty)$,

$$\begin{cases} \frac{u_k(x) - u_{k-1}(x)}{h} - \Delta_p u_k = 0 & \text{in } \Omega \\ u_k(0,x) = u_0(x) & \text{on } \partial_p\Omega, \end{cases} \tag{2}$$

where $k = 1, 2, ... \in \mathbb{N}$, h be a positive parameter but close to zero, $h \to 0$, and the initial data $u_0 \in W^{1,p}(\Omega, \mathbb{R}^n)$.

Such as the evolutional system (2), we have the p-energy functional, defined for functions $u_0(x)$ is any given initial data belonging to the Sobolev space $W^{1,p}(\Omega, \mathbb{R}^n)$, that is

$$E_k(u) := \int_\Omega \frac{1}{2}\frac{|u - u_{k-1}|^2}{h} + \frac{1}{p}|Du|^p dx, \tag{3}$$

for any $u \in X := W^{1,p}(\Omega, \mathbb{R}^n) \cap \left\{u - u_0 \in W_0^{1,p}(\Omega, \mathbb{R}^n)\right\}$.

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