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Phase Transformations and Mechanism of Thermoelasticity and Pseudoelasticity in Shape Memory Alloys

Author: Prof. Osman Adiguzel, Firat University, Department of Physics, Turkey

Abstract

Shape memory alloys are new class of functional materials, due to the response to the external effects like stressing and variation of temperature. Shape memory effect is based on martensitic transformation, which is a solid-state phase transformation and govern the remarkable changes in internal crystalline structure of materials. Shape memory alloys can exhibit two peculiar properties, shape memory effect (SME) and pseudoelasticity (PE). Shape memory effect is performed thermally by heating and cooling after deformation in low temperature martensitic state; this behavior is called thermoelasticity (TE). Pseudoelasticity is performed in only mechanical manner by stressing and releasing in the parent austenite phase region. Shape Memory Effect (SME) is performed thermally in a temperature interval depending on the forward (austenite → martensite) and reverse (martensite → austenite) transformation, on cooling and heating, whereas pseudoelasticity is performed by stressing the material in the strain limit in the parent phase region, and shape recovery is performed simultaneously upon releasing the applied stress. PE is the result of stress-induced martensitic transformation and performed in non-linear way, unlike normal elastic materials and exhibits rubber like behavior. Loading and unloading paths are different in pseudoelasticity, and cycling loop reveals energy dissipation.

Thermal induced martensitic transformations occur on cooling with cooperative movement of atoms by means of lattice invariant shears on a $\{110\}$ - type plane of austenite matrix which is basal plane of martensite. The lattice invariant shears occurs, in two opposite directions, $\langle 110 \rangle$ - type directions on the $\{110\}$ -type basal plane. This kind of shear can be called as $\{110\}\langle 110 \rangle$ - type mode, and possible 24 martensite variants occur. By this way the twinned martensite occurs on cooling, and the twinned structure turn into the detwinned martensite by means of stress induced martensitic by deforming the material in the low temperature product phase condition. The parent phase structures turn into the detwinned structure by means of stress induced martensitic transformation by deformation in the pseudoelasticity. Copper based alloys exhibit this property in metastable beta-phase region. Lattice invariant shear is not uniform in copper-based alloys and cause the formation of unusual complex layered structures, like 6R, 9R and 18R depending on the stacking sequences on the closepacked planes of the ordered lattice.

In the present contribution, x-ray diffraction and transmission electron microscopy (TEM) studies were carried out on two copper based CuZnAl and CuAlMn alloys. X-ray diffraction profiles and electron diffraction patterns reveal that both alloys exhibit super lattice reflections inherited from parent phase due to the displacive character of martensitic transformation. Specimens of these alloys were aged at room temperature for along term, and x-ray diffractograms taken during ageing show that diffraction angles and peak intensities changed. In particular, some peak pairs providing a special relation between Miller indices come close each other. This result refers to a new transition and rearrangement of atoms in diffusive manner. Keywords: Shape memory effect, martensitic transformation thermoelasticity, pseudoelasticity, twinning, detwinning.

Design and Implementation of a Genetically Designed Non-Linearly Controlled Non-inertial referenced UAV

Authors: Fady M. A. ALAlami¹, Naim Ajlouni² İSTANBUL ÜNİVERSİTESİ FEN BİLİMLERİ ENSTİTÜSÜ¹ Faculty of Engineering Istanbul Aydin University²

Abstract

This work addresses the tracking issue for a none inertial frame referenced quadrotor UAV which is controlled by a genetically optimized non-linear controller.

Some of the current application of quadrotors, such as those used in sea search and rescue will be launched from a moving vesile which means the landing of such vesails will need to take into consideration the inertial position of the vesil to be landed on.

Nearly all current research in this area model the daynamics of the quadrotor UAV's based on a fixed inertial frame. The most widely used inertial frames are the Geodetic Coordinate System that depend on the earth's surface and the Earth-Centered Fixed Coordinate System.

This work will take into consideration the inertial of moving object "ship" as a noneinertial frame reference, the aim is to carry out the orientation, rotation and velocity calculation based on the ship a none inertial reference frame. The kinematics of the quadrotor will take into consideration the rotation and orientation for the both of the none-inertial reference frame of the ship and the body frame reference. The dynamics of the system will depend on the initial take off point as an inertial reference to give a correct dynamical effect on the body frame of the quadrotor. As most accidents take place during bad weather condition, a robust control system is used. Most of the quadrotor control systems assume stable flying condition; this work unstable harsh nonlinear condition is considered. As a result, a non-linear controller will be designed and used to control the UAV. The nonlinear controller performance compared against the performance of a quadrotor controlled by a linear controller. Genetic algorithms used to optimize both the linear and nonlinear controllers. The performance of the nonlinearly controlled UAV will be more efficient than that of the linearly controlled UAV while performing in the none ideal operation conditions.

Problems of and Holistic Solutions for Agricultural Businesses in Chiang Mai

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Abstract

This research aims to study the problems and find solutions of major agro-industries in Chiang Mai, Thailand. The sample was divided into two parts: The supply side was the government agency, educational institutions and civil society. Demand side was Agro-Industry entrepreneurs. The methodology was focus on meeting the stakeholder debate, and group workshop, the first step of the research was selected the potential agro-industry group to study then in the operating phase, the survey was conducted to analyze and synthesize the problems of agro-industry and find solutions by group meetings in order to present a holistic problem-solving model. This process will provide opportunity for stakeholders and related agencies to collaborate and propose appropriate guidelines for action. The results show that, within demand side, the three most important issues are labor issues, marketing and production problems respectively. While the supply side, the top three issues are the integration problems, lacking of language skills / expertise, and lacking of database. Based on the analysis of both demand and supply side, there is a lack of concrete cooperation from relevant agencies, especially in policy cooperation. Therefore, a policy that responds to the problems of agro-industry is essential for all agencies to focus on and implement concrete measures to address sustainable issues.

Key words

1. Agricultural Industry refers to agricultural business relating to production, food processing to acquire products that can be transformed to commercial products which includes using direct input or by-product inputs.
2. Solving problems by using integrative approach refers to process in solving problems by labor-related organization; i.e., governmental organization, academic institutions from private, public and civic society working together to develop labor' skill.

1. Introduction

Agricultural industry is one the essential industry to enhance Thai economy by creating values to agricultural products. The industry has created jobs for the workforce and in return, those workforce can make a living by working in the industry. This is considered to be the source of income for farmer family and community in the remote area. The agricultural industry has the potential in exporting products and has brought income to Thailand approximately 1.4 trillion baht (20.5% of the total export in 2016). Among this amount, 12.9% is from primary agricultural product and 7.6% is secondary/ food-processed products). Based on evaluating the industry problem, it is found that agricultural-product exporting structure has not been changed from the past. However, the production is facing with some difficulties, that is, lack of raw material both in terms of quantity and quality, the readiness of SMEs', lack of labors and managerial and supporting problems accompanied with global warming issues. On the demand side, consumers' behavior has been changed which has affected raw material production and production structure of the industry. In the future, trend in trading near the borders and the increasing investment will affect to industry directly especially to those near the border of Thailand. There will be the expansion of agricultural industry-which would be the results of direct investment. As per to limitation of farming area in Thailand, the production of certain agri-product such as rice, rubber, sugar cane, potato and livestock including the production of papers may be relocated to neighbor countries. This is caused by the competitive advantage in terms of resources and farming land. Such changes will led to the change in supporting industry and continuing industry. Thailand must be changed itself from 'low-cost production' to 'technology transfer' to neighbor countries (Integrated Industrial Development Plan based on Fiscal Year of 2017, The Office of Industrial Economy).

The study of problems and entrepreneurs' requirement from agricultural industry has become necessary in order to facilitate both private and public make efficient production planning or setting policy including setting roles for themselves in supporting and developing the industry to the same direction. Apart from this increasing investment to boost the potential of agricultural business exporter as the goal of sustainable development of Thailand hoping that it would be suitable to changing environment, beneficial as the new form of cooperation.

2. Literature Review

Taemlertboonchai (2016) has studied trend in the development of Thailand Industry, changes affecting industry in the world economy, favorable characteristics of industry in the future and efficient policy in making tranformation to creative and knowledgable industry. The importance of agricultural industry, supporting SMEs, the reduction of logistic cost, power management and efficient environment management are unavoidable. Those requires the development of technology and man power as the drivers to the goals.However, such goals will be achieved unless strategy and related policy are not clearly set up. Policy setting and strategic practices are required in the past few years; namely, determining plans, project and result of research study on industry development. This is the high time to realize the importance of 114 industrial policies and put it to use immediately.

Maikansarn and Munkhum (2011) studies the adaptation of agricultural industry to the new world context. The changes has happended so fast resulting in the adaptation of agricultural sector. Many developing countries has studies and expected the trend so that they can better adjust to the new

world environment. Apart from that, they aim to grow sustainable and increase their competitive advantage in the world market.

3. Purpose of the study

3.1 to search for vital information for analyzing purpose to solve the right problems for agricultural industry.

3.2 to let stakeholders taking part in developmental plan policy.

3.3 to utilize result of the study to analyze and find solutions for agricultural industry.

4. Expected Results

4.1 to understand agricultural entrepreneurs' problems in Chiang Mai

4.2 to understand methods in solving such problems from organizations involved in agricultural industry

4.3 to utilize the results of the study and solve the related problems.

5. Methodology

5.1. Scope of the study

This study contains the scope in two perspectives which are

5.1.1 Demand Perspective would concentrate on agricultural industry problems in Chiang Mai

5.1.2 Supply perspective would concentrate on solving process and integrating process from other governmental departments- relating to develop and supporting, academic institutions, community in Chiang Mai

5.2 Population

5.2.1 On demand side, population are agricultural entrepreneurs in Chiang Mai and civil society which are Chiang Mai Chamber of Commerce and Federation of Industry

5.2.2 On supply side, Government organizations set up at the goal of developing and supporting agri industry such as Labor Office, Industry Office, Commercial Office etc and academic institutions both private and public.

Primary data

This data was acquired from workshop by inviting all parties from demand and supply mentioned to reflex real problems, needs including ways in working together, by brainstorming utilizing Zopp card and by summarizing through focus group.

5.3 Data collection

Data collection was done by workshop conference with meta approach, plenary and group discussion, unconstructed interview on opinions regarding overall problems, internal organization problem and ways to solve such problems.

5.4 Data Analysis

1. Supply analysis was conducted on analyzing what is going on in the present which hopefully would lead to the needs in the future and then the strategic plan and policy would be set up.
2. Demand analysis was conducted on evaluating the future demand so that priorities should be properly set up for each party, including knowledge and skills required and technological requirements in the future.
3. Gap analysis can be done by comparing supply and demand so that the shortage from both sides can be understood; namely, scarcity or the inability to supply what is demanded and two over-supply identification. This comprehension would reduce the gap between supply and demand side.

6.Result of the study

6.1 Demand (9 entrepreneurs)

It is found that

6.1.1 Problems of Agricultural Industry in Chiang Mai

Dimension	Problems
	- lack of operational workforce and knowledgeable workfoce
	-lack of machine and technology which lead to inefficient production
Production	-Unconstant output as it is the nature of agricultural production
	-small output per Rai (high cost of production)
	-lack of support in connecting between agricultural sectors and industry

Dimension

Problems

-decreasing food production which has led to lack of raw material in food processing industry

-no development in production to add value

-lack of expertise in adding value to the product

-losing quality and quantity during the production process

-natural disaster and plants and animal plaque

-lack of workforce in certain season such as reaping season or producing seasons

-lack of skillful labor during high demand production

-lack of basic labor (grade 9-12)

-lack of semi-skillful and unskillful labor as they prefer to continue their education

Workforce

-no new workforce as the existing labor are elderly in the community

-no labor who is proficient in English, computer skills

-labor lacks of experience which is difficult to apply theory to the real world

-labor lacks of communication skills

-labor tends to follow instruction which cause the lack of creativity

-labor with bachelor degree tends to ask for higher wage

-Increasing value in continuing labors' education.

Marketing

-on few markets for agricultural products

-No clear price determination (no regulations in setting price)

Dimension

Problems

- little involvement of governmental organization
- There is obstacles in entering international market as per to trade barriers
- trades has been conducted to middlemand
- price fluctuation
- there are many competitors both from domestic and international
- there is no marketing strategy and strategic plan
- there is no public relations on branding
- farmers lacks of marketing knowledge
- high cost of transportation
- there is no concrete conglomerate which lead to lack of bargaining power

Investing

- lack of funds/ lack of liquidity
- high cost of factors of production
- instability of politics
- objection of factory building
- lack of governmental support
- higher cost of transportation

Knowledge and Technology

- lack of knowledge and understanding in technology
- production doesn't utilize technology
- farmers sticks to old producing method

Dimension

Problems

Policy

-lack of knowledge from research on technology, and machinery to apply to production in Thailand context

-farmers and entrepreneurs have been confused with inconsistent policy

-Government organization does not support constantly in the industry

-the instability in politics has caused the insecurity of entrepreneurs which lead to decreasing investments

-Government policy is not in accordance with region requirement

-Delay in policy enactment.

6.1.2 Prioritizing problems

Problems	Score	The order
Labor	8	1
marketing	7	2
production	5	3
policy	3	4
Knowledge and technology	1	5

6.1.3 Causes and solution

1.Labor

Cause

1. lack of labor/ inconsistent working
- 2.unskillful labor/ no expertise
3. high wage, unskillful labor

Solution

- Setting labor market
- Setting training to increase knowledge and skill
- Government should take part in to solve the problem

2. Marketing

Cause

1. few market
2. few export

Solution

- Supporting of agricultural product processing
Value adding
- Finding more connection arbor

3. Production

Cause

1. High cost of raw material
2. High cost gasoline
3. High wage

Solution

- Find the way to reduce cost
Supporting the use of bio-fertilizer
- Finding renewable energy
- Government should assist in wage and support new technology

Based on problems and weakness of agricultural industry, it has shown problems in production, labor, marketing, funding, knowledge and technology including policy setting. Stakeholders has shown their opinion differently which can be concluded that the major problems are funding and technological knowledge with few perspective while problems on production and marketing seems to have several facets.

6.2 Supply

6.2.1 Problems from the Industry group, academic institution and civil society

Dimension

1. Language and Expertise

Problems

1. Lack of communication skill
2. Lack of certain skills such as production, marketing, innovating to add value for the product

Dimension	Problems
	<ol style="list-style-type: none">3. Lack of English language skill4. Lack of third language skill
2. Policy	<ol style="list-style-type: none">1. Central policy is not serious in solving the labor, marketing problems2. Top-down command has led to real participation of community3. Community was misled4. Management lacks of pedagogical management
3. Value	<ol style="list-style-type: none">1. Attitude, and collaborating with supporting organization2. Value of rotating jobs an don't want to participate in the industry3. Students choose what is popularity not from what is worth for agricultural production4. Students lack of discipline5. New graduate aims to high compensation but accumulating of experience6. Value of continuing their education7. Society value, social problems affecting quality of student and labor8. Attitude of the trainees in required curriculum
4. Budget	<ol style="list-style-type: none">1. Lack of operational lab2. Lack of budget3. Lack of support in developing human resource4. Number of project can not be fully supported
5. Curriculum	<ol style="list-style-type: none">1. Curriculum has not aimed to build expertise in agricultural production2. Few text books3. Curriculum is not in accordance with strategic plan
6. Entrepreneur	<ol style="list-style-type: none">1. Few job availabilities2. Few job availabilities after the training3. Few certified labors4. Lack of entrepreneur's awareness to collaborate in developing labors' skill5. Inconsistency between job and wage6. Job required experience worker

Dimension

Problems

- | | |
|-----------------------------|---|
| 7.Integrative collaboration | <ul style="list-style-type: none"> 7. Lack of developing workers’ plan 1. Lack of Competency Base Curriculum between entrepreneur and academic institution 2. Lack of coordination between entrepreneurs and government organization 3. Lack of coordination between academic institution and entrepreneur 4. Students are unaware of economic status before entering to workplace 5. Lack of coordination between stakeholders 6. Lack of support from government 7. Lack of coordination to improve labors’ skill 8. Lack of coordination from other related organizations 9. Lack of proper skills from relevant organizations |
| 8. Database | <ul style="list-style-type: none"> 1. Lack of Database of developing labor to match with requirements from entrepreneurs 2. Lack of database of requirement 3. Lack of research based on agricultural industry-related problems 4. Lack of information on labors 5. Lack of information on developing business 6. Lack of information on job position which led to inability to set up long-term plan 7. Unstable of Demand for Labor Proportion |

6.2.2 Prioritized Problems

Problems	Score	The order
Integrative Collaboration	13	1
Language and Expertise	8	2
Database	5	3
Value	3	4
Policy	1	5
Entrepreneur	1	5
Curriculum	1	5

Budget

0

6

6.2.3 Cause of problems and solution

1. Integrative collaboration

Causes

Solution

Government

- | | |
|---|---|
| <p>1. Change of Bureaucratized System has not been effective because of top-down policy, application of data, lack of evaluation and follow-up plan, executive's vision</p> | <p>1. Decision making should be changed from individual to committee of agricultural industry-related department</p> <p>2. Agri-cultural government department should utilize the same database which is updated and easy to apply</p> <p>3. Government should review and listen to comments from stakeholders seriously so that the recommendations can put to use efficiently</p> |
|---|---|

Private

- | | |
|---|--|
| <p>1. Lack of coordination among private, public and academic institutions</p> <p>2. Lack of research to support integrative collaboration</p> <p>3. Lack of information to assist in making decision</p> | <p>1. Develop work pattern of agricultural industry by letting private sector be part in setting up policy so policy can be enacted</p> <p>2. Private sector should participate in budgeting of research project</p> |
|---|--|

Academic Institution

- | | |
|--|--|
| <p>1. Academic severice has not reflected real problems the industry</p> <p>2. Lack of coordination between academic private and public sector</p> <p>3. Key person can not integrate knowledge and practices together</p> | <p>1. Academic institutions should set up policy that involving agri-industry. Academic can set up policy partly so policy can be put to use and match with industry problems</p> <p>2. Academic institution should be parted in project budgeting</p> |
|--|--|

3. Academic institution should take part and support personnel who be knowledgeable in agricultural industry

2. Language and Expertise

Cause

1. lack of continuous improvement
2. lack of confidence in communication
3. lack of opportunity in working
4. Lack of efficiency in real practice before students are graduated

Problem

1. create awareness of importance of required skills before entering to industry
2. Set up curriculum to support giver and taker
3. set up contest activity such as innovation of agricultural product contest
4. Adjust academic system in accordance with demand

3. Database

Cause

1. Lack of information exchange between organizations; entrepreneurs, academic institutions, labor, private and public institutions
2. Lack of major coordinating center and updated information
3. Lack of IT personnel's which lead to inability to search for agricultural industry demands

Solution

1. All parties should have M.O.U. in exchanging and updating information
2. Setting up the coordinating center by selecting delegating staff from all parties
3. Setting training course for entrepreneurs on IT skills, such as searching

Based on the analysis of strength and weakness of agricultural industry, it is found that there are several facets of problems which are language skills and expertise, policy, value, budget, curriculum, entrepreneurs, integrative collaboration and database. Stakeholders has confirmed the mentioned problems. Major weakness are integrative collaborations, language and expertise, and lack of updated database.

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8. Summary

It is found that problems of agricultural industry in Chiang Mai are labor, marketing and production. On supply side, the first three problems are Integrative collaboration, language and expertise skill, and lack database. It is believed that the problems existed because of lack of objective collaboration from related organizations such as entrepreneurs, academic institutions and government sectors especially in policy setting- which can be major driver to involve stakeholders in solving industry-related problems in Chiang Mai. Therefore, setting up policy that can responds to problems is vital for stakeholders in order to solve the problem objectively.

Electro-optical simulation of in ultra-thin photonic crystal amorphous silicon solar cells

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Abstract — Hydrogenated amorphous Si (a-Si:H) is an important solar cell material. The critical problem in the a-Si:H-based photovoltaic cell is increasing the conversion efficiency. To overcome the difficulty, higher conversion efficiency demands a longer optical path to increase optical absorption. Thus, a light trapping structure is needed to obtain more efficient absorption.

In this context, we propose a complete solar cell structure for which a 1D grating is etched into the ultrathin active absorbing layer of a one-dimensional "CP 1D" photonic crystal a-Si: H characterized by the optimal parameters: period $a = 480$ nm, a filling factor $ff = 50\%$ and a depth $d = 150$ nm. This was selected by varying the CP1D parameters to maximize the absorption integrated into the active layer. CP1D is suggested as an intermediate layer in the solar cell concentration system.

This study allowed us to model the optical and electrical behavior of a CP1D solar cell. After optimization of the geometrical parameters (period and fill factor ... etc.), we concluded that the CP1D led to greater optical gains than for their unstructured equivalent. The simulation clearly illustrates that the electric field strongly affects the electro-optical characteristics of the devices studied, and that it is clear that 1D PC solar cells as active layer have exhibited a high electric field distribution. We have focused on the net on the effect of the active layer and its beneficial role in the sense of expressing the photovoltaic performance of the devices.

Keywords— *Photonic crystal; finite element method (FEM); Absorption; dimensional; electro-optical.*

Transferred policies and planning solutions in urban mobility: The significance and the role of contextual indicators as determinants of outcomes of planning interventions.

Authors: Ar. Surashmie Gawande, Dr. Vinayak Adane Visvesvaraya National Institute of technology (VNIT) India

Abstract

Transfer or transplant is an age-old phenomenon especially in policy making domains of various fields. In transport planning its manifestation is evident in policy making, interventions and other 'soft' approaches to tackle ever-increasing and complex mobility challenges. At the same time, evidence from cities across the world points to unique and varied outcomes once the transferred measure is in place. They seem to be marginally or partially successful in the recipient cities or regions. This paper investigates the grade separator as one such transferred measure from the developed economies to cities from the developing economies. Examination reveals there are causes and factors underlying the phenomenon of transfer in policy, planning and intervention provision in urban transport planning in their adopted places. The paper investigates two issues:

1) The rationale of transfers and manifestation in urban transport planning across geographic boundaries. 2) And which factors determine the outcomes.

Keywords: urban mobility, transferability, policy, comparative, context, indicators

Non-linear stability analysis of thin-walled steel box beam

Authors: Prof. ABDELKADER SAOULA, SID AHMED MEFTAH, ABDELRAHMANE B. BENYAMINA Ibn-e-Khuldoon University, Algeria

Abstract

This paper treats the elastic lateral torsional buckling of thin-walled box beam elements, under bending and axial forces. For this purpose, a nonlinear kinematic model based on higher order theory is considered. Ritz's method is adopted as solution strategy in order to obtain the nonlinear governing equilibrium equations. Following, the buckling loads are obtained by requiring the tangent stiffness matrix to be singularity. The proposed method with the new stiffness terms is efficient and accurate in lateral torsional buckling predictions in comparison with the commercial FEM code ABAQUS results.

Keywords: Non-linear, instability of thin - walled, Box beams, Ritz's method.

A higher-order shear deformation theory with stretching effect for static analysis of laminated composite plates

Authors: Dr. Khaled BOUAKKAZ, Dr. Kada DRAICHE, Dr. Abdelouahed TOUNSI Ibn-e-Khuldoon University, Algeria

Abstract: This work presents a static analysis of laminated composites plates by employing a novel higher-order shear deformation theory with stretching effect by a sinusoidal variation of all displacements through the thickness and satisfies the stressfree boundary conditions on the top and bottom surfaces of the plate without using shear correction factor. The displacement field of the proposed theory has only five unknowns, which is even less than the other shear and normal deformation theories. The principle of virtual works is used to derive the governing equations and boundary conditions. The closed form solutions are obtained by using Navier procedure for crossply laminated composite plates subjected to sinusoidal load for simply supported boundary conditions. The numerical results are compared with those predicted by other theories to show the effects of shear deformation and thickness stretching on displacement and stresses.

Keywords: Static analysis, Shear deformation theory, Stretching effects, Laminated composite plates.

A simple quasi-3D shear deformation theory for the bending analysis of functionally graded beams

Authors: Dr. Kada DRAICHE, Dr. Khaled BOUAKKAZ, Dr. Abdelouahed TOUNSI Ibn-e-Khuldoon University, Algeria

Abstract

This paper presents bending analysis of functionally graded beams (FGBs) by using a simple and accurate quasi-3D hyperbolic shear deformation theory, in which both shear deformation and thickness stretching effects are included. The displacement field is based on a novel kinematic in which include the undetermined integral terms and the hyperbolic sine function is used in terms of thickness coordinate to represent the effect of transverse shear deformation. The generalized governing differential equations are derived by employing the principle of virtual work. A Navier-type closed-form solution is obtained for functionally graded beams subjected to uniform load for simply supported boundary conditions. The accuracy of the present theory is verified by comparing the obtained numerical results with TBT quasi-3D solutions and with those predicted by higher-order shear deformation theories. It can be concluded that the proposed theory, which does not require shear correction factor, is not only accurate but also simple in solving the static behaviour of functionally graded beams.

Keywords: Functionally graded beams, Bending, Stretching effects, Governing equations.

Web-post buckling of steel symmetric cellular beams: Non-linear finite element analysis

Author: Dr. Benyagoub DJEBLI, Dr. Djamel Eddine KERDAL Ibn-e-Khuldoon University, Algeria

Abstract

The main aim of this work is to study up to failure the behavior of steel symmetric cellular beams with or without web transverse stiffeners (transverse stiffeners at the level of concentrated loads or support reactions). A numerical analysis by finite element has been done to predict the ultimate load as well as the associated modes failure, namely both web-posts buckling due to shear force and web-posts buckling due to compression force. The numerical model takes into account material and geometric nonlinearity as well as the geometrical initial imperfections. This analyze was used to show the reduction of the resistance to steel cellular beams in the non-linear domain.

Vibration analysis of functionally graded Microbeam

Authors: Dr. Youcef Tlidji, Dr. Mohamed Zidour, Dr. Kadda Draiche, Dr. Mohamed Bourada, Dr. Abdelouahed Tounsi

Ibn-e-Khuldoon University, Algeria

Abstract

In the current paper, a quasi-3D beam theory is developed for free vibration analysis of functionally graded microbeams. The volume fractions of metal and ceramic are assumed to be distributed through a beam thickness by power function law distribution. The modified coupled stress theory is used to incorporate size dependency of micobeam. The equation of motion is

derived by using Hamilton's principle and Navier type solution method was used to obtain frequencies. Numerical results show the effects power index and material scale parameter on fundamental frequencies of microbeams.

OLAP and Data warehousing over Big data

Authors: Asma Belaroussi, DhiaEddine Mesbaiah, Mostefa Belhadj Aissa Houari Boumediene
Science and technology University, Algeria

Abstract

A strong interest towards the term "Big Data" is arising in the literature actually, this term identifies specific kinds of data set which populate the data layer of several computing applications. These data have some specific characteristics in common such as: the huge volume, velocity which indicates the speed of data in and out, and variety describing the range of data types and sources... With the goal of deriving intelligence and extracting useful knowledge from such kinds of datasets, it's natural to adopt data warehousing and OLAP methodologies in order to collect, extract, transform and also warehouse and OLAP those data sets Universities already collect vast amounts of data so the academic data have been growing significantly and become big academic data. Therefore, University's top-level management needs tools to produce information from the records. The generated information is expected to support the decision-making process of top-level management. This paper explores how big data technology could be implemented with data warehouse to support decision making process. From this perspective, we propose MongoDB as big data storage and analytic tool to be implemented for the Operational Data Store (ODS) in the ETL level of the decisionmaking framework.

Image Recognition using ProMoD Backpropagation Algorithm

Author: Dr. Ahmet Gürhanlı Istanbul Aydın University, Turkey

Abstract

Training an artificial neural network needs intense and long computations. Many smart backpropagation algorithms have been proposed in order to improve the accuracy of the network and ensure a faster learning performance. Fast learning is especially important in platforms where computing resources are limited, power is an important limitation, and short timing constraints are imposed. Image recognition is one of the most important fields of machine learning and has many practical applications. In this research ProMoD, a new backpropagation algorithm which is inspired by PID control, is tested on an image recognition application. MNIST data set is used for evaluating the performance. Well-known Momentum technique reached 0.05 error level after 133 batches. ProMoD achieved that level after processing 53 batches. The results show that, in image recognition applications, ProMoD may halve the training time and power with respect to the Momentum technique.

Adopting e-government directions to shape the future of UAE higher Education. A case study of Zayed University – transformation journey

Author: Dr. Maytha Al Ali Sheikh Zayed University, United Arab Emirates

Abstract

The United Arab Emirates (UAE) have developed a long-term goal of e-government transformation and enforced on all government entities and government funded universities “a top down strategy to enable the transformation of traditional practice into digital one”. The presentation will highlight the case of (UAE) government as a policy maker and Zayed University as an implementer to achieve the UAE vision 2021 to position the UAE among the best countries in the world that adopt First -Rate Educational System.

The E-Government strategy has already embraced Artificial intelligence, Technology, Big Data, process automations in its direction to encourage all UAE government funded university in the UAE to redefine their vision mission and strategic goals and implement the best Educational Practices.

Over the past five years, Zayed University (ZU) has built a foundation to enhanced innovation and efficient services and the rapid expansion of E-learning and E-services. Positive steps have been taken towards technical investment on supporting the changes taking place in academic and support services at ZU, to achieve efficiency and maintain its e-services. For example, introducing number of initiatives to align ZU strategy with the KPIs to measure the progress in all the operations.

Like all Higher Education Institutions, Zayed University understands the importance of social media, to draw in prospective students to the exciting and dynamic experience that the university’s offer. In addition, ZU provides a range of Smart services, ranging from admission processes to applications for career counselling. The services are targeted at students, staff and the public. These capabilities meet the needs of stakeholders and largely contribute to achieving the strategic objectives. Internal efficiency has been achieved by a number of developments, for example, reengineering and automating some of the processes, introducing new online channels for E-learning, E-forms, online payments, internal systems such as faculty performance management system, and other external portals that connect government entities, employers, and ZU community. All of this have been done to simplify the services and enhance the customer journey and to achieve leading position locally and internationally.

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