

IEEE-CIS-Chapter Mexico

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Newsletter IEEE Computational Intelligence Society - Chapter Mexico

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No. Edited by: Dr. Oscar Castillo Dr. Patricia Melin

EDITORIAL

Dear members:

In this edition of the newsletter we offer a report on the participation of the Chapter members at World Congress on Computational Intelligence held in Vancouver this past month. We invite you to participate in the main event of the Chapter the "International Seminar on Computational Intelligence ISCI 2006", to be held in Tijuana Mexico on October 9-11 this year. We include a detailed call for papers of ISCI 2006 in this issue. Also, we invite you to participate in the IFSA 2007 World Congress to be held in Cancun next year. We also include a detailed call for papers and special sessions for IFSA 2007 in this issue of the newsletter. We renew the invitation to all members of the chapter to send us their contributions to be included in the next edition of the newsletter, which will be the December 2006 issue.

CHAPTER NEWS

Participation of CIS Chapter Mexico Members in WCCl'2006 at Vancouver

I he Mexican Chapter of the Computational Intelligence Society was well_represented at the



World Congress in Computational Intelligence, recently held in Vancouver, Canada, on July 16-21, 2006. There was a participation of

over 20 members from Mexico, which can be said that it is the largest group ever at this series of events. It is worth mentioning that there was an invited speech on "20 Years of Evolutionary Multi-Objective Optimization: What Has Been Done and What Remains to be Done", presented by Dr. Carlos Coello from CINVESTAV, Mexico City.



Dr. Coello during his presentation at the WCCI'06 Congress.

Also, Dr. Edgar N. Sanchez from CINVESTAV-Guadalajara organized a panel discussion on "Successful Real-World Applications by Computational Intelligence", with well known experts in computational intelligence that attracted a lot of attendants.



Dr. Edgar Sanchez conducting his organized panel during the WCCI'06 Congress

It is worth noting that several of the papers, presented by Mexican researchers, were part of two Special Sessions organized by Dr. Patricia Melin and Dr. Oscar Castillo. One of the sessions was organized in the program of the Neural Networks Conference (IJCNN) and the papers presented by Mexican researchers are shown in Table 1. The other session was organized in the program of the Fuzzy Systems Conference (FUZZ) and the papers are presented in Table 2. There was also a meeting of the Mexican Chapter the last day of the Congress to discuss future activities (first photo of this issue).



Dr. Oscar Castillo during his presentation at the WCCl'06 Congress, on the stability of type-2 fuzzy logic controllers.



From Left to right, Dr. Gary Yen, Dr. Oscar Castillo and Dr. Patricia Melin at the closing ceremony of WCCl'06



Several of the Mexican members enjoying the Banquet of the WCCl'06 Congress.

 T able 1 Papers in the Special Session "Hybrid Neural Intelligent Systems" organized by Dr. Patricia Melin

AUTHORS	TITLE OF THE PAPER		
Pilar Gomez-Gil and Manuel Ramirez-Cortes	Experiments with a Hybrid-complex Neural Networks		
(University of las Americas, Puebla)	for Long Term Prediction of Electrocardiograms		
Patricia Melin, Olivia Mendoza, Miguel Soto,	An Intelligent System for Pattern Recognition and		
Maribel Gutierrez and Daniel Solano	Time Series Prediction using Modular Neural		
(Tijuana Institute of Technology)	Networks		
Javier Vega, Mario Chacon and Roberto	Synthesis of Pulsed-Coupled Neural Networks in		
Camarillo	FPGAs for Real-Time Image Segmentation		
(Chihuahua Institute of Technology)			
Jose A. Ruz-Hernandez, Edgar N. Sanchez	Designing an Associative Memory via Optimal		
and Dionisio A. Suarez	Training for Fault Diagnosis		
(CINVESTAV-Guadalajara and IIE)			
Jose_Refugio Vallejo	Spherical Neural Networks and Some Applications		
(University of Guanajuato)			
Alejandro Flores-Mendez and Eduardo	Forecasting Time Series with a New Architecture for		
Gomez-Ramirez	Polynomial Artificial Neural Network		
(La Salle University, Mexico City)			
Patricia Melin, Jerica Urias, Jassiny Quintero,	Forecasting Economic Time Series Using Modular		
Martha Ramirez and Omar Blanchet	Neural Networks and the Fuzzy Sugeno Integral as		
(Tijuana Institute of Technology)	Response Integration Method		

Table 2 Papers in the Special Session "Hybrid Fuzzy Intelligent Systems" organized by Dr. Oscar Castillo

AUTHORS	TITLE OF THE PAPER	
Salvador Carlos-Hernandez, Gerard Mallet,	A TS Fuzzy Observer for an Anaerobic Fluidized Bed	
Jean F. Beteau and Edgar N. Sanchez	Reactor	
(CINVESTAV-Guadalajara)		
Gerardo Maximiliano Mendez and Maria de	Modelling and Prediction of the MXNUSD Exchange	
los Angeles Hernandez	Rate Using Interval Singleton Type-2 Fuzzy Logic	
(Nuevo Leon Institute of Technology)	Systems	
Mario Chacon and Graciela Ramirez	Fuzzy Clustering Algorithms in Subjective	
(Chihuahua Institute of Technology)	Classification Tasks	
Jose Luis Gonzalez-Vazquez, Oscar Castillo	A Generic Approach to Fuzzy Logic Controller	
and Luis Tupak Aguilar-Bustos	Synthesis on FPGA	
(Tijuana Institute of Technology)		
Oscar Castillo, Patricia Melin and Nohe	Design of Stable Type-2 Fuzzy Logic Controllers	
Cazarez	Based on a Fuzzy Lyapunov Approach	
(Tijuana Institute of Technology)		

There were also other papers by Mexican researchers in the WCCl'2006 technical program, not a part of the special sessions, please check the web site for more details (www.wcci2006.org).

Conference Travel Grants

The IEEE Computational Intelligence Society Student Travel Grant Program offers a limited number of travel grants to assist IEEE Student Members presenting papers at IEEE CIS sponsored conferences. This year, four major

conferences were covered by this program. The conferences for 2006 included WCCI 2006 (IJCNN 2006 + FUZZ-IEEE 2006 + CEC 2006) 2006 IEEE World Congress on Computational Intelligence; Vancouver, Canada; July 16-21. Three Travel Grant Recipients from the CIS Mexico Chapter were selected to this program:

Nancy Arana-Daniel (Centro de Investigación y Estudios Avanzados IPN, México) Jorge Rivera-Rovelo (Centro de Investigación y de Estudios Avanzados de, México)

A. Ruz-Hernandez (CINVESTAV, Unidad Guadalajara, Mexico, Mexico)

these students were financially supported (partially) by the IEEE to participate at the WCCl'06 Congress.



A. Ruz-Hernandez presenting his paper in one of the Special Sessions of WCCI'06.

New Task Force of the IEEE Neural Networks Technical Committee:

"Hybrid Intelligent Systems"

On the Neural Networks Technical Committee Meeting held in Vancouver at WCCl'06 a new Task Force was created to promote research on hybrid intelligent systems. The task force was originally proposed by Dr. Patricia Melin and after a unanimous vote was accepted by the Committee. A description of this recently created task force is given below.

Chair:

Patricia Melin, Tijuana Institute of Technology, Mexico

Founded Members

Witold Pedrycz, University of Alberta, Canada **Janusz Kacprzyck**, Polish Academy of Sciences, Poland

Oscar Castillo, Tijuana Institute of Technology, Mexico

Roseli Aparecida Francelin Romero, University of Sao Paulo, Brazil

Eduardo Gomez-Ramirez, La Salle University, Mexico

Edgar Sanchez, CINVESTAV, Guadalajara, Mexico

Background

Soft computing can be used to build hybrid intelligent systems for achieving different goals in real-world applications. Soft Computing (SC) techniques include, at the moment, fuzzy logic, neural networks, genetic algorithms, chaos theory methods, and other similar techniques that have been proposed in recent years. Each of these techniques has advantages and disadvantages. and several real-world problems have been solved, by using one of these techniques. However, many real-world complex problems require the integration of several of these techniques to really achieve the efficiency and accuracy needed in practice. In particular, genetic algorithms can be used to optimize the topology of a fuzzy or a neural system. Also, there are neuro-fuzzy approaches or even neuro-fuzzygenetic approaches for designing the best intelligent system for a particular application. The Task force will consider different combination of SC methodologies to design efficient hybrid intelligent systems.

Neural networks are computational models with learning (or adaptive) characteristics that model the human brain. Generally speaking, biological natural neural networks consist of neurons and connections between them, and this is modeled by a graph with nodes and arcs to form the computational neural network. This graph along with a computational algorithm to specify the learning capabilities of the system is what makes the neural network a powerful methodology to simulate intelligent or expert behavior. Neural networks can be classified in supervised and unsupervised. The difference is that in the case of the supervised neural networks the learning algorithm uses inputoutput training data to model the dynamic system. on the other hand, in the case of unsupervised neural networks only the input data is given. In the case of an unsupervised network, the input data is used to make representative clusters of all the data. It has been shown, that neural networks are universal approximators, in the sense that they can model any general function to a specified accuracy and for this reason neural networks have been applied to problems of

system identification, control, diagnosis, time series prediction, and pattern recognition. The complexity of real-world problems has also motivated the introduction of modular and ensemble neural networks. In this case, of particular interest is the problem of response integration, which is very important because response integration is responsible for combining all the outputs of the modules. Basically, a modular or ensemble neural network uses several monolithic neural networks to solve a specific problem. The basic idea is that combining the results of several simple neural networks we can achieve a better overall result in terms of accuracy and also learning can be done faster. For example, for pattern recognition problems, which have great complexity and are defined over high dimensional spaces, modular neural networks are a great alternative for achieving the level of accuracy and efficiency needed for realtime applications.

Fuzzy logic is an area of soft computing that enables a computer system to reason with uncertainty. A fuzzy inference system consists of a set of if-then rules defined over fuzzy sets. Fuzzy sets generalize the concept of a traditional set by allowing the membership degree to be any value between 0 and 1. This corresponds, in the real world, to many situations where it is difficult to decide in an unambiguous manner if something belongs or not to a specific class. Fuzzy expert systems, for example, have been applied with some success to problems of decision, control, diagnosis and classification, just because they can manage the complex expert reasoning involved in these areas of application. The main disadvantage of fuzzy systems is that they can't adapt to changing situations. For this reason, it is a good idea to combine fuzzy logic with neural networks or genetic algorithms, because either one of these last two methodologies could give adaptability to the fuzzy system. On the other hand, the knowledge that is used to build these fuzzy rules is uncertain. Such uncertainty leads to rules whose antecedents or consequents are uncertain, which translates into uncertain antecedent or consequent membership functions. Type-1 fuzzy systems, like the ones mentioned above, whose membership functions are type-1 fuzzy sets, are unable to directly handle such uncertainties. In this case, type-2 fuzzy systems, in which the antecedent or consequent membership functions are type-2 fuzzy sets are better suited for modeling these problems. Such sets are fuzzy sets whose membership grades themselves are type-1 fuzzy sets; they are very useful in circumstances where it is difficult to determine an exact membership function for a fuzzy set. Another way to handle this higher degree of uncertainty is to use intuitionistic fuzzy logic, which can also be considered as a generalization of type-1 fuzzy logic. In intuitionistic fuzzy logic the uncertainty in describing fuzzy sets is modeled by using at the same time the membership function and the non-membership function of a set (assuming that they are not complementary).

Genetic algorithms and evolutionary methods are optimization methodologies based on principles of nature. Both methodologies can also be viewed as searching algorithms because they explore a space using heuristics inspired by nature. Genetic algorithms are based on the ideas of evolution and the biological process that occur at the DNA level. Basically, a genetic algorithm uses a population of individuals, which are modified by using genetic operators in such a way as to eventually obtain the fittest individual. Any optimization problem has to be represented by using chromosomes, which are a codified representation of the real values of the variables in the problem. Both, genetic algorithms and evolutionary methods can be used to optimize a general objective function. As genetic algorithms are based on the ideas of natural evolution, we can use this methodology to evolve a neural network or a fuzzy system for a particular application. The problem of finding the best architecture of a neural network is very important because there are no theoretical results on this, and in many cases we are forced to trial and error unless we use a genetic algorithm to automate this process. A similar thing occurs in finding out the optimal number of rules and membership functions of a fuzzy system for a particular application, here a genetic algorithm can also help us avoid time consuming trial and error.

Motivation for the Task Force

There is a need for investigating hybrid approaches combining neural networks with other intelligent methodologies, for this reason we consider that it is appropriate to provide a forum for the interaction between the neural network community and the different communities in computational intelligence (like fuzzy logic and evolutionary computing). This Task Force will contribute to the integration of different Soft methodologies Computing (SC) the development of hybrid intelligent systems for modeling, simulation and control of non-linear dynamical systems. SC methodologies at the

moment include (at least) Neural Networks, Fuzzy Logic, Genetic Algorithms and Chaos Theory. Each of these methodologies has advantages and disadvantages and many problems have solved. by using one of these methodologies. However, many real-world complex problems require the integration of several of these methodologies to really achieve the efficiency and accuracy needed in practice. In Task Force, research on all SC methodologies will be considered, and their applications to modeling, simulation and control, will also be given careful consideration. Detailed methods for integrating the different SC methodologies in solving real-world problems will also be considered by the members of the Task Force. Hybrid intelligent systems with applications on the following areas will be considered: Robotic Dynamic Systems, Non-linear Plants. Manufacturing Systems, Pattern Recognition and Time Series Prediction.

Main Activities of the Task Force

One of the main activities of the Task Force will be organizing Special Sessions at important Conferences on Neural Networks, Fuzzy Logic, Evolutionary Computation and Hybrid Intelligent Systems. Another important activity will be the organization of Special Issues on this theme in important Journals (like the Transactions on Neural Networks) and Edited Books on the same subject. Workshops and Conferences on Hybrid Intelligent Systems will be considered also in the future.

News and activities of this recently formed task force will be disseminated to the members of the Mexican Chapter.

THESES

Development and application of a Neural Network-based scheme for Fault Detection and Diagnosis in Fossil Electric Power Plants

hesis Author: Jose A. Ruz-Hernandez

Grade: Ph. D.

Defense Day: July 28th, 2006 Institution: CINVESTAV-Guadalajara

Advisors of thesis: Edgar N. Sanchez Dionisio A. Suarez Jury: Edgar N. Sanchez Eduardo J. Bayro Alexander Loukianov Ofelia Begovich Dionisio A. Suarez Wen Yu Liu

Abstract: This work presents the methodology, the development and application of a neural network-based scheme for fault detection and diagnosis in fossil electric power plants. The scheme is constituted by two components: residual generation and fault classification. This scheme is the main original result of the thesis. The first component generates residuals via the difference between measurements coming from the plant and a neural network predictor. The neural network predictor is trained using healthy data collected from a full-scale simulator reproducing reliably the process behavior. In absence of faults, the residuals are only due to noise and unmodeled dynamics. When a fault occurs, the residuals deviate from zero in different

For the second component, detection thresholds are used to encode the residuals as bipolar vectors, which are analyzed to determine the fault patterns. The fault patterns are stored in an associative memory for fault classification. The memory design is based on a recurrent neural network, which is trained via a proposed new optimal training algorithm. The proposed training algorithm maximizes the margin between the training patterns and the decision boundary. The design problem considers: 1) obtaining of weights via an optimal hyperplane algorithm for support vector machines and 2) obtaining conditions to quarantee that the total number of spurious memories is small as possible and the basis of attraction of desired memories is big as possible. The neural network scheme is evaluated using a full-scale simulator. The evaluation considers the detection and diagnosis of faults appearing when load power is constant. Likewise, the detection and diagnosis is considered when some any fault occurs and the operator carries out load power changes to satisfy the energy demand. Also, the scheme is able to diagnose a normal operating condition when the operator is carry out load power changes free of fault. The scheme avoids that load power changes are diagnosed as if a fault were occurring.

A Generic Approach to Fuzzy Logic Controller Synthesis on FPGA

Thesis Author: Jose Luis Gonzalez Vazquez

Grade: M. Sc.

Defense Day: March 17th, 2006

Institution: Tijuana Institute of Technology

Advisors of thesis: Oscar Castillo Luis Tupak Aguilar

Jury: Oscar Castillo Luis Tupak Aguilar Patricia Melin

Abstract: This work describes a general procedure for Fuzzy Logic Controller (FLC) synthesis on Field Programmable Gate Arrays (FPGA) devices. The hardware implementation of a simple state machine for data flow control, the VHDL hardware description code of the FLC components, the observed synthesis hardware requirements on a Xilinx Spartan-3 FPGA and executions times achieved, errors due to finite control word length is reported. The modifications required in this modular approach to implement a variety of FLC on a readably available FPGA device are also presented.

Modular design of a state machine of the implementation of a FLC on a FPGA allows to reused optimized code on each of the fixed modules employed, maintaining consistent executions times, consistent and predictable usage of FPGA hardware resources, thus allowing inclusion of specific modules that define the particular FLC model to implement. These VHDL optimized to-be-edited modules facilitates synthesis of a wide variety of FLC models thus producing a flexible implementation and short design cycles.

The use of FPGA as a development platform make possible changing constants parameters of the MFs, rules and defuzzification hardwired via VHDL , out-of-FLC controller values, thus given the developer the ability to use the same hardware on conditions were FLC parameter are determine during regular operation, such the case as hybrid systems that including neural nets of such other tools can achieve a self fine-tuning controller or an adaptable one.

New Book

Redes neuronales. Conceptos fundamentales y aplicaciones a control automático (Neural Networks: foundations and automatic control applications)

Edgar Nelson Sánchez Camperos and Alma Yolanda Alanís García CINVESTAV, *Unidad Guadalajara* ISBN: 8483222957, Pearson Educación, S.A, 2006



ABSTRACT : This book presents artificial neural networks (ANN) foundations and its application to automatic control. It with begins relationship between biological neural networks and artificial ones. Then the classical models of ANN are presented; after that, specialized topologies as vector support machines and recurrent high order neural networks are

described. Besides, the book also includes ANN training based on an extended Kalman Filter and is complemented by a set of applications of ANN to identification and control of nonlinear systems. The theoretical concepts are complemented with examples, applications and proposed exercises for each one of the topics analyzed.

The book is intended for last year undergraduate courses and for first year graduate ones; besides, scientists, from different fields can use it as reference. The book attempts to be an important source, in Spanish, of literature which is not easy to find in this language.

The book has nine chapters, and it is organized as follows:

Preface

Index

Notations

Abbreviations

Chapter 1. Introduction to artificial neural networks

Chapter 2. The learning process

Chapter 3. The perceptron

Chapter 4. The multilayer perceptron

Chapter 5. Radial basis neural networks

Chapter 6. Support vector machines

Chapter 7. Recurrent neural networks

Chapter 8. Neural network learning using the extended Kalman filter

Chapter 9. Identification and control with neural networks

Appendix 1. Bibliography Subject Index

CALL FOR PARTICIPATION

International Seminar on Computational Intelligence 2006

IEEE CIS- Chapter Mexico October 9-11, 2006, Tijuana, Mexico Hosted by: Tijuana Institute of Technology

General Chair: Prof. Dr. Patricia Melin,
Tijuana Institute of Technology –Mexico
Program Co-Chairs: Prof. Dr. Oscar Castillo, Tijuana
Institute of Technology –Mexico
Prof. Dr. Eduardo Gomez-Ramirez La Salle University,
Mexico,
www.hafsamx.org/cis-chmexico/seminar06

The International Seminar on Computational Intelligence will be held this year in Tijuana, Mexico, October 9-11, 2006. The Seminar is organized by the IEEE Computational Society, Chapter Mexico, and technical supported by the Hispanic American Fuzzy Systems Association (HAFSA). Sponsorship of the Seminar is by the Tijuana Institute of Technology and the National Research Council of Mexico (CONACYT). The Seminar will consist of Distinguished Lectures, Invited Lectures, regular paper presentations and student paper presentations. The first day of the Seminar, for the opening ceremonies, Prof. Witold Pedrycz will give a Keynote presentation, under the IEEE Distinguished Lecture Program, entitled "Human-Centric **Constructs** Granular Computing and Fuzzy Logic". After keynote presentation, several invited speakers, coming from Mexico and USA will give interesting lectures on their respective areas of research. A technical program of regular and student paper presentations will follow. Also, a workshop on "Hybrid Intelligent Systems" will be organized by members of HAFSA on the second day of the seminar. For the students, a Best Paper Competition will be organized, and awards for the best three papers will be given to the students.

Registration

There will be no official cost of registration to the International Seminar. However, registration is strongly encouraged, as space will be limited to 60 participants in this seminar, deadline for registration is September 22, 2006. For more information visit the web page:

www.hafsamx.org/cis-chmexico/seminar06

CALL FOR PAPERS

IFSA 2007 World Congress

HAFSA Association
June 18-21, 2007, Cancun, Mexico
Hosted by: Tijuana Institute of Technology
General Chair: Prof. Dr. Oscar Castillo

General Chair: Prof. Dr. Oscar Castillo
Tijuana Institute of Technology –Mexico
Program Chair: Prof. Dr. Patricia Melin, Tijuana
Institute of Technology –Mexico

www.hafsamx.org/ifsa2007

The IFSA 2007 World Congress will consist of papers describing research work that deals with Computational Intelligence (CI) methodologies for the development of hybrid intelligent systems. CI methodologies at the moment include (at least) Neural Fuzzy Logic, Networks, Genetic Algorithms, Intelligent Agents, and Chaos Theory. The use of intelligent techniques, like neural networks, fuzzy logic and genetic algorithms, for real-world problems is now widely accepted. However, still the performance of any of these techniques can be improved, in many situations, by using them in conjunction with other techniques. For example, genetic algorithms can be used to optimize the design of a neural network for time series prediction, or fuzzy logic can be used to combine the information from expert neural modules, just to mention two cases. Also, mathematical methods, like the ones from Chaos and Fractal Theory, can be used in conjunction with intelligent techniques to improve the performance of hybrid systems for real-world applications. The international conference will consist of papers addressing these hybrid approaches and similar ones, either theoretically or for real-world applications. Also, distinguished internationally recognized invited speakers will give lectures on the main areas of CI. The conference is intended primarily for researchers and graduate students working on these research areas

Call for Papers:

- 1 Successful new applications to real-world problems of CI techniques that are found to achieve better results than conventional techniques. In this case, special attention should be given to the metrics used to compare CI techniques with conventional ones.
- 2 Developments of innovative hybrid methods combining CI techniques and conventional techniques. In this case, the problems to be considered in these papers may not be as complex as the ones in the previous point, but the authors have to explain very carefully how their proposed method could be used, in the future, to solve real-world problems.
- 3 Papers considering original research on new CI architectures, models or techniques are also welcome, but the authors would have to make a detailed description of how their proposed approach is compared with other related approaches.

Specific Topics of interest (not limited to)

Fuzzy Logic Theory

Fuzzy Control

Fuzzy Logic in Pattern Recognition

Type-2 Fuzzy Logic

Intuitionistic Fuzzy Logic

Fuzzy Logic Applications

Neural Networks Theory

Neural Network Control

Neural Networks for Prediction

Neural Networks for Pattern Recognition

Modular Neural Networks

Neuro-Fuzzy Models and Applications

Evolutionary Computing Theory

Genetic Algorithms for Applications

Genetic Algorithms for Neural Network

Optimization

Genetic Algorithm for Fuzzy System

Optimization

Genetic Fuzzy Systems

Genetic Neural Systems

Neuro-Fuzzy-Genetic Approaches

Intelligent Agents

Swarm Intelligence

Chaos Theory and Fractals

<u>Call for Special Sessions and Panel</u> <u>Discussions</u>

The IFSA 2007 Program Committee also solicits proposals for special sessions and panel discussions within the technical scope of the congress. Special sessions or panel discussions

are organized by internationally recognized experts, and aimed to bring together researchers in a focused topic. Papers submitted for special sessions or panel discussions are to be peer-reviewed with the same criteria used for the contributed papers.

Researchers interested in organizing a special session or a panel discussion are invited to submit a formal proposal by e-mail to Program Chair Prof. Patricia Melin, pmelin@tectijuana.mx.

Special session or panel discussion proposals should include the session title, a brief description of its scope, motivation, and its appeal to the attendees of this conference, organizer names, contact information, and brief CVs of the organizers.

Important Due Dates

Special Session and Panel 8 September, 2006

Discussion Proposals:

Acceptance of Special 18 September, 2006

Session and Panel:

Paper submission: 16 October, 2006
Decision Notification: 15 December, 2006
Camera ready copy due 29 January, 2007
Conference dates: 18-21 June, 2007

For more information visit the web page: www.hafsamx.org/ifsa2007

CONTRIBUTIONS FOR THE NEXT ISSUE

We invite all members of the chapter to send us their contributions for publication in the next edition of the newsletter.

The information that you can send are: Articles, Conference Report, Call for Papers, Conference Calendar, and all other news that you consider can be of interest for chapter members.

For your contribution send an e-mail to pmelin@tectijuana.mx.