The Henry Eldridge Department of Mathematics and Computer Science

Seminar Series

Fall 2018

DATE

October 25, 2018

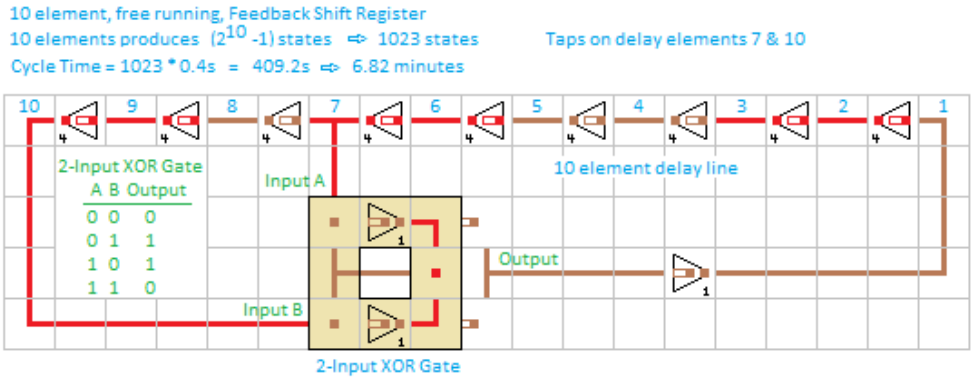
TIME

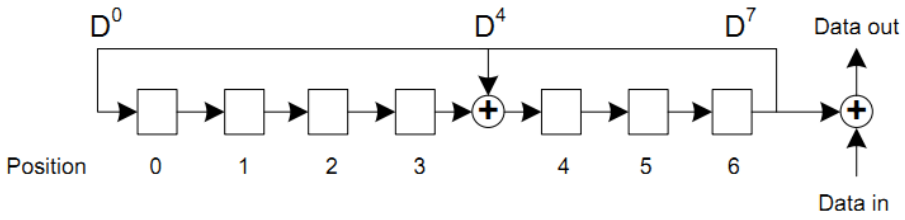
2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTER: Dr. Daniel Okunbor





Generating Maximum Order Linear Feedback Shift Registers on Commodity Multicores Computing Systems

Abstract: Linear Feedback Shift Registers (LFSRs) are used as pseudo random number generators and to understand their theoretical foundation, polynomials (especially, primitive polynomials) in Galois Field GF (2) are utilized. These primitive polynomials provide maximum length LFSRs. Constructing primitive polynomials adopting LFSRs is computationally expensive both in terms of processor time and memory usage. In this paper, we demonstrate how to generate LFSRs using message passing single program multiple data (SPMD) constructs on commodity computing systems with 4 to 8 cores. In addition, we analyze the linear complexity of a few of the LFSRs generated.

About the author:

Dr. Daniel Okunbor is a Professor of Computer Science in the Department of Mathematics and Computer Science at Fayetteville State University. He served as Director of Research and Assistant Dean in the College of Arts and Science between 2006 and 2015. In 2015-2016 academic year, he was on sabbatical leave at the University of Abuja, Nigeria as a Visiting Fulbright Scholar in the Department of Computer Science. Dr. Okunbor is a product of the University of Benin, where he graduated with B.Sc. (First Class Honors) and M.Sc. in Industrial Mathematics and the University of Illinois at Urbana-Champaign, where he obtained Ph.D. in Computer Science. Dr. Okunbor's research interests are in numerical and parallel computing, dynamic goal programming and fuzzy logic, campus mobile computing, machine learning, cyber security, and analysis of social networking sites.

For more information please contact:

Dr. Valentin Milanov

Sci&Tech 408

910-672-2202

FAYETTEVILLE STATE UNIVERSITY

The Henry Eldridge Department of Mathematics and Computer Science

Seminar Series
Fall 2018

DATE

November 29, 2018

TIME

2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTER

Dr. Chekad Sarami

Department of Mathematics and Computer Science, FSU

Preparing students to compete in a high-tech Industry via Project based Learning

Abstract: There are a great deal of job opportunities in high-paying tech fields for students every year. In Summer 2018, the speaker participated in Google's Faculty in-residence (FIR) program in Mountain View, CA. Project based learning was the main theme of the program. Project Based Learning (PBL) is a cooperative, student-centered approach to teaching, that emphasizes on building of related skills through practice, sustained inquiry and facilitated learning through the creative design and management of a project or product. It is known that if PBL implemented properly in classrooms, it increases the employability of the students. The speaker will demonstrates the principles and best practices of project based learning based on his participation in the FIR program. Other topics such as hiring process, duties of Google engineers will be discussed in this talk.

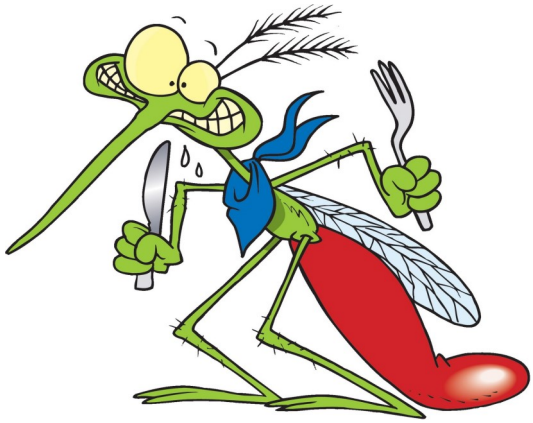
For more information please contact:

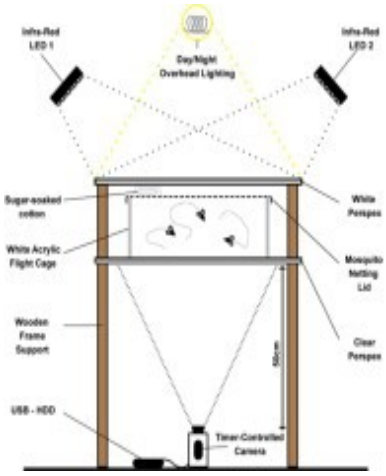
Dr. Valentin Milanov

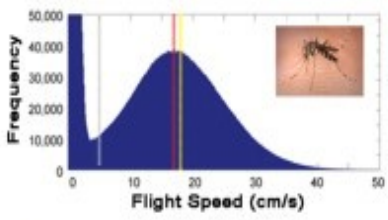
Sci&Tech 408

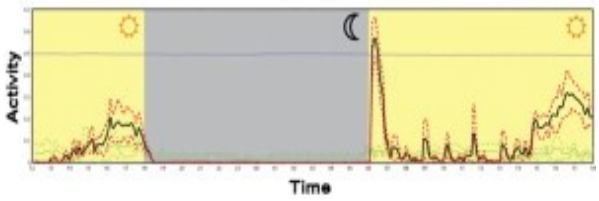
FAYETTEVILLE STATE UNIVERSITY

The Henry Eldridge Department of Mathematics and Computer Science









Video Tracking of Insect Flight Path: Towards Behavioral Assessment*

Abstract: We will present a cohort of new methods that cooperate together to improve the detection/tracking of mosquitos in a 2D video clip. A commonly recognized challenge in the biotechnology research field is evaluating the effect of a repellent which entails tracking the unpredictable flight paths of the insects, which may be swift flying or slow moving. Our work presented in this talk provides an efficient tool to deal with tracking the small insects with unpredictable moving patterns by proposing a new dual foreground and background modeling/updating system for target detecting and tracking. The proposed processing elements take advantage of the similarity of the frames and use the estimated speeds to collectively capture the relevant information and contribute in concert to ensure fast and accurate measurement to reach the goal of behavior evaluation of mosquitos in response to a repellent.

Seminar Series Spring 2019

DATE

January 24, 2019

TIME

2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTERS

Dr. Yufang Bao, Department of Mathematics and Computer Science, FSU

*** Joint Work with Dr. Hamid Krim,** ECE Department, North Carolina State University

For more information please contact:

Dr. Valentin Milanov

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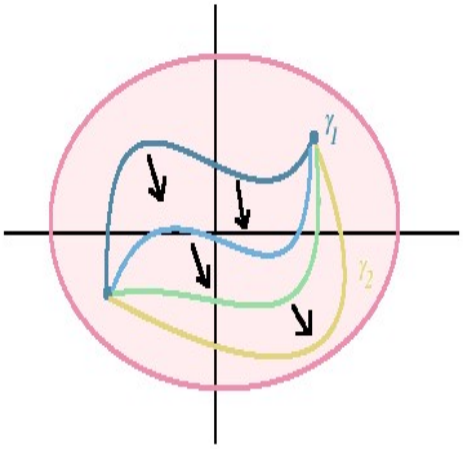
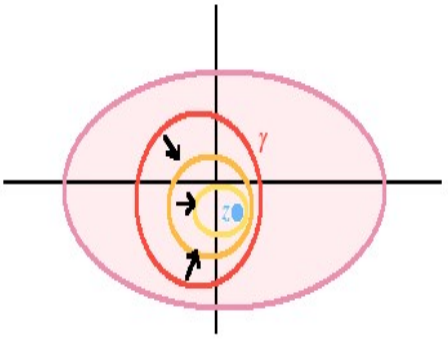
The Henry Eldridge Department of Mathematics and Computer Science



Hopotopic Curves



Closed, Piecewise Smooth Curve Homotopic to a Point

Seminar Series
Spring 2019

DATE

February 28, 2019

TIME

2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTER

Dr. Frank Nani, Professor

Department of Mathematics and Computer Science, FSU

Generalized Cauchy Integral Theorems for holomorphic and meromorphic functions defined over domains with multiple singularities and multiple connectivity.

Abstract: Let f be a complex-valued function defined over a domain **Ω** which is not necessarily simply-connected. Let **S** be the set of isolated non-removable singularities of **f**. Suppose **C** is a closed chain in **Ω** such that $f \in H(\Omega^*)$, where $\Omega^* = \Omega \backslash S$ with $S = \{z_{01}, z_{02}, \dots, z_{0k}\}$, $Card(S) < \aleph_0$.

In this talk, the classical Cauchy-Goursat theorem, Cauchy integral formulas and Cauchy residue theorems are generalized for a meromorphic function f on multiply-connected domains.

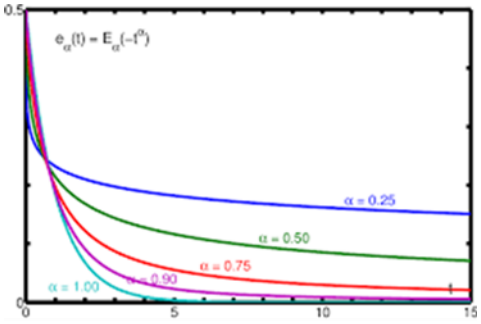
For more information please contact:

Dr. Valentin Milanov

Sci&Tech 408

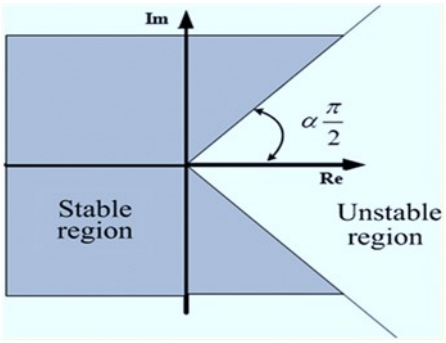
FAYETTEVILLE STATE UNIVERSITY

The Henry Eldridge Department of Mathematics and Computer Science



Plots of the Mittag-Leffler function $E_\alpha(-t^\alpha)$ for $0 < \alpha < 1$.

Figure 1 – Plots of the Mittag-Leffler function



Stability region of linear fractional-order system $\frac{d^\alpha x}{dt^\alpha} = Ax(t)$ with $0 < \alpha < 1$.

Figure 2—Stability Region of Linear fractional-order systems

Stability by Iterative Method for Fractional Differential Equations with Time-Varying Coefficients*

Abstract:

We study a system of fractional differential equations (FDEs) with time-varying coefficients and give conditions to ensure that the zero solution is asymptotically stable by means of Gauss-Seidel type iterative method. The use of this method in differential equations of fractional-order is an area not yet widely investigated, although it proves to be very effective for equations of integer-order. In this project, we will refine the method to provide a combined qualitative and numerical approach to the stability theory for FDEs and show that the solutions of a class of FDEs with time-varying coefficients can still decay in time like $t^{-\alpha}$ as $t \to \infty$, the property known only to exist in linear time-invariant fractional-order systems in the literature. We also provide an explicit upper bound function $M_\alpha t^{-\alpha}$ to the Mittag-Leffler function $E_\alpha(-t^\alpha)$ with a precise constant M_α.

Seminar Series Spring 2019

DATE

March 28, 2019

TIME

2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTER(S)

Dr. Bo Zhang and Dr. Yufang Bao, Department of Mathematics and Computer Science, FSU

***Joint work with Dr. Jingxia Cui, School of Applied Technology, Changchun Institute of Technology, China**

For more information please contact:

Dr. Valentin Milanov

Sci&Tech 408

FAYETTEVILLE STATE UNIVERSITY

The Henry Eldridge Department of Mathematics and Computer Science

Seminar Series
Spring 2019

DATE

April 25, 2019

TIME

2:00—3:00 pm

PLACE

Sci&Tech Room 229

PRESENTERS

Dr. Elia (Ali) Shahbazi, Posdoctoral Research Fellow Laboratory of Neuropsychology, NIH National Institute of Mental Health

Applications of Mathematics & Computer Science in Brain Science and Neuroscience

Abstract:

For many years, biological fields like medicine, brain science, neuroscience, and genetics were solely based on medical/biosciences. Scientists used to work in their labs using microscopes and their subjects of animals and organs, but nowadays science cannot go further without using other fields like mathematics and computer science. My project mostly focused on understanding how the brain works. I am using microscopic images of in-vivo and ex-vivo brains to analyze them and reconstruct a 3D model of brain connectome blueprints and in the other hands I am working with Monkeys to record their brain activities and with analyzing the brain electric signals and responses find a way to unlock this pandora box. As a former mathematician and computer scientist, I am widely using math and computer science to accelerate the processing and analyzing phases in brain science projects. so let's look at human brain together and find our how math and computer science going help us to understand it.

For more information please contact:

Dr. Valentin Milanov

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