2017 Gulf of Mexico Spring School (GMSS)

Deep Learning ANN and Applications Workshop

Sponsored by International Neural Network Society (INNS)

Time: April 16-18, 2017 (April 16 is Easter Sunday)

Location: Aero-propulsion, Mechatronics and Energy (AME) Center

               2003 Levy Ave, Tallahassee, FL 32310

Organizer: Florida A&M University - Florida State University College of Engineering,

               Tallahassee, FL

Abstract Due: <mark>April 3, 2017</mark>

Notification Date   April 10, 2017

Abstract Submission: Submit abstract and Register workshop or copy the following link:

https://docs.google.com/forms/d/e/1FAIpQLSfId_rCOgAG4cQzYo-7YfbQ0SNfOoePBGjvrHpy64Z-AY6ysg/viewform

Co-Chairs: Dr. Harold Szu, Dr. Simon Foo (sfoo@fsu.edu), Dr. Henry Chu

               (chu@lousiana.edu)

Hotel Accommodations:

    Residence Inn Tallahassee Universities at the Capitol

    600 W Gaines St, Tallahassee, Florida 32304

    Phone: 1-850-329-9080

    Website: http://www.marriott.com/hotels/travel/tlhdt-residence-inn-tallahassee-universities-at-the-capitol/?scid=bb1a189a-fec3-4d19-a255-54ba596febe2

GMSS will offer <mark>free registrations to qualified students</mark>.

Elsevier Scientific Publication will publish "Deep learning & Applications" conference book 2018, edited by Drs. Harold Szu, Simon Foo, and Henry Chu.

Call for papers will cover, but not limited to, the following topics:

(1) *Artificial Neural Networks (ANN)* have recently succeeded in *Deep Learning (DL) by Google, Face Book, You Tube that* emulating Human Visual System V1-V5 layers for automatic Feature Extraction (FE) in colors, edges, shapes, contours, & textures; given a known classes of training objects, either dogs or cats, etc. Then, one can use the Machine Learning (ML statistics learning e.g. Vepunic SVM) to classify the objects. The review of the combined system is given in *"Deep Learning" Yann LeCun, Yoshua Bengio & Geoffrey Hinton, Nature V. 521, pp. 436-444, May 28, 2015*. Such a Supervised Learning is executed on multiple layers of ANN the output based on Lease Mean Squares (LMS) Error Cost Function and passed the blame backward through hundreds layers of ANN consisting of millions neurons at each layers. This has been referred to Deep Learning by Hinton et al. in 1988; but it was not possible until recently, due to the advent of Massively Parallel Distributed Supercomputing, e.g. *Graphic Processor Units* hundreds layers of millions neurons in pseudo real time. Deep learning can help *Big Data Analysis (BDA)*, e.g. Data Mining, Drug Discovery, and also "Precision, Personalized, Preventive and Preemptive (4P) Medicine' as advocated early transition "From Benches to Beds," by NIH. For example, *Cancer Drug* Anti-Programming Death-1 by *Merck* (Keytruda: pembrolizumab class: Anti-PD-1 monoclonal antibodies) as the presenter to immunotherapeutic treatment that has cured President Jimmy Carter's brain tumor including liver

cancer in three weeks but it took more than 6 months recuperating due to over-cure; as well as *Smartphone Sensors Suite and Cloud Computing* for Healthcare System.

(2) **Biological Neural Networks (BNN)** & **Brain Neurosciences** have answered the decades puzzling question about why Einstein has the same number of neurons tenth Billion but seems to be fast & smart with the help of brain white matter due to 100 Billion *Glial (Greek: Glue) cells*; The Glial Cells might answer why 67 Million aging WWII baby boomers over seventies in the US alone tended to have mental disorders. It turns out that good quality sleep is necessary for Astrocyte Glial cells (tenth smaller in size) to clean out large energy consumption (20%) by-products Amyloids etc. to prevent Alzheimer (Nedergaard & . Sci. Am. March 2016); *Reverse Aging* (besides macroscopic study by Prof. Luigi Fountain Wash U St Louis; and microscopically by chromosome end cap Telomeres that have Hayflick 50 turns, as discovered by Nobel Laureate Karen Blackburn): Recently Shinya Yamanaka discovered 4 longevity genes related to epigenome and won the Nobel Prize for Stem Cell Research Oct. 8, 2012.

(3) **Natural Intelligence (NI)** requires no teachers and is based on Survival Instincts operated at the isothermal brain equilibrium at the minimum free energy (MFE) without the need of supervision;

(4) **Computational Intelligence compares** what NI unsupervised learning at MFE can do against what ANN supervised learning at LMS cannot. This advances the future intelligent robots from "zoombot to office mates"

(5) **Poster Competition** in the evening of April 16.

Featured Topics by invited speakers:

- "**Natural Intelligence by MFE unsupervised learning,**" can do for survival reasons that ANN by LMS supervised learning cannot do. We introduce MIQ, Harold Szu, cf. Book: "Natural Intelligence Neuromorphic Engineering (NINE)", (Elsevier 2017)

- "**Deep Learning Emotional Intelligence,**" Soo-Young Lee, Dir. Brain Research Institute, KAIST, South Korea

- "**Neural Networks for Intelligent Integration,**" Prof. Robert Kozma, President of INNS, U.T. Memphis

- "**Neural Network for Disaster Management,**" Prof. C-H Henry Chu, Dir. FEMA, ULL, Lafayette Louisiana.

- "**Deep Learning and Optimization,**" Prof. Simon Foo, Chair of ECE, FAMU-FSU, Tallahassee, FL

- "**Large-scale graph networks applied to brain data processing**," Prof. Anke Meyer-Baese, FSU

- "**Human Visual System Deep Learning for Feature Extraction**," Dr. Yufeng Zheng, Alcorn State University