Report on the visit of IEEE Computational Intelligence Society
Distinguished Lecturer Professor Julia Chung
to the Rio de Janeiro Chapter

Due to the social distancing measures imposed by the COVID-19 pandemic, Rio de Janeiro received Professor Julia Chung's lecture via Zoom Meetings. Details on this event are presented below.

- **Distinguished Lecture**

  Date: August 30th, 2021, 9:00 AM to 10:15 AM (Rio de Janeiro time)

  Organizer: Harold Dias de Mello Junior (Chair of the CIS/IEEE Rio de Janeiro Chapter)

  Location: remote meeting (via Zoom)

  Title: Convolutional Networks for Medical Image Analysis: Its Past, Future, and Issues

  Abstract: Recent advancement of image understanding with deep learning neural networks has brought great attraction to those in image analysis into the focus of deep learning networks. While researchers on video/image analysis have jumped on the bandwagon of deep learning networks, medical image analyzers would be the coming followers. The characteristics of medical images are extremely different from those of photos and video images. The application of medical image analysis is also much more critical. For achieving the best effectiveness and feasibility of medical image analysis with deep learning approaches, several issues have to be considered. In this talk we will give a brief overview of the development of neural networks for medical image analysis in the past and the future trends with deep learning. Several issues in regard of the data preparation, techniques, and clinic applications will also be discussed.

  Description: This event was announced on the Rio Chapter's Website: https://r9.ieee.org/rdj-cis/cis-distinguished-lectures-program-convolutional-networks-for-medical-image-analysis-its-past-future-and-issues-aug-25th-2021-9-am-brt/

  Previously, all Chapter members were notified by email.

  The event was also published on the group of the Brazilian Computational Intelligence Society and even on international lists.

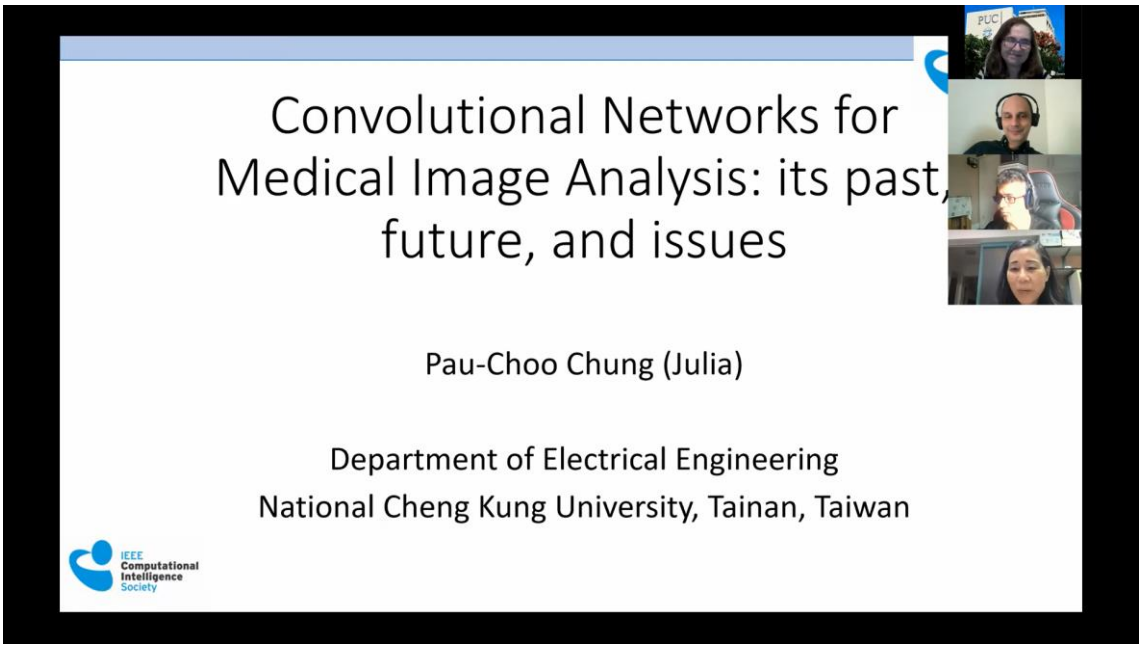
  A pre-registration was made on the Rio Chapter's Website. We had 67 registrations approved. However, the lecture was attended by up to 25 attendees, including undergraduate, graduate, professors, and researchers. In a very comprehensive

approach, Dr. Julia initially introduced the basics of neural networks. Then she discussed: AlexNet, texture and color criteria, and feature extraction in different types of medical images, using wavelet transform and Gabor filters. Later, a neural network model for detecting oral cancer was presented. Recent deep convolutional neural networks were explained, and the interpretability of the results was discussed, including the transfer of learning and the reduction of the region of ambiguity in tissue images.

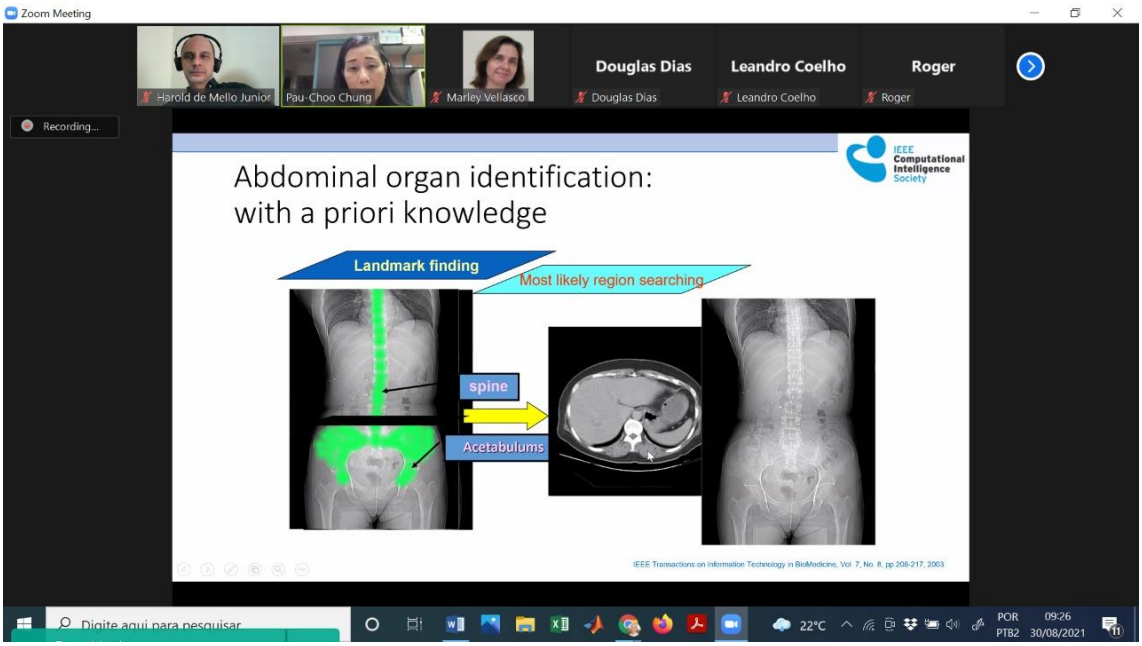
The 1-hour talk was very well received and gave rise to some participants' questions, with about 15 minutes of detailed answers by DL Julia Chung. The Rio de Janeiro Chapter kindly thanks professor Julia Chung and IEEE CIS DL Program.

This lecture is available privately on the Rio de Janeiro Chapter channel on YouTube for its members.
https://youtu.be/qSOSjCDtCP8

Some photos of the meeting are included below.



Professor Julia starts her talk


Zoom Meeting
Harold de Mello Junior
Pau-Choo Chung
Marley Vellasco
Douglas Dias
Douglas Dias
Leandro Coelho
Leandro Coelho
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Abdominal organ identification:
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Landmark finding
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IEEE Transactions on Information Technology in BioMedicine, Vol. 7, No. 8, pp 208-217, 2003
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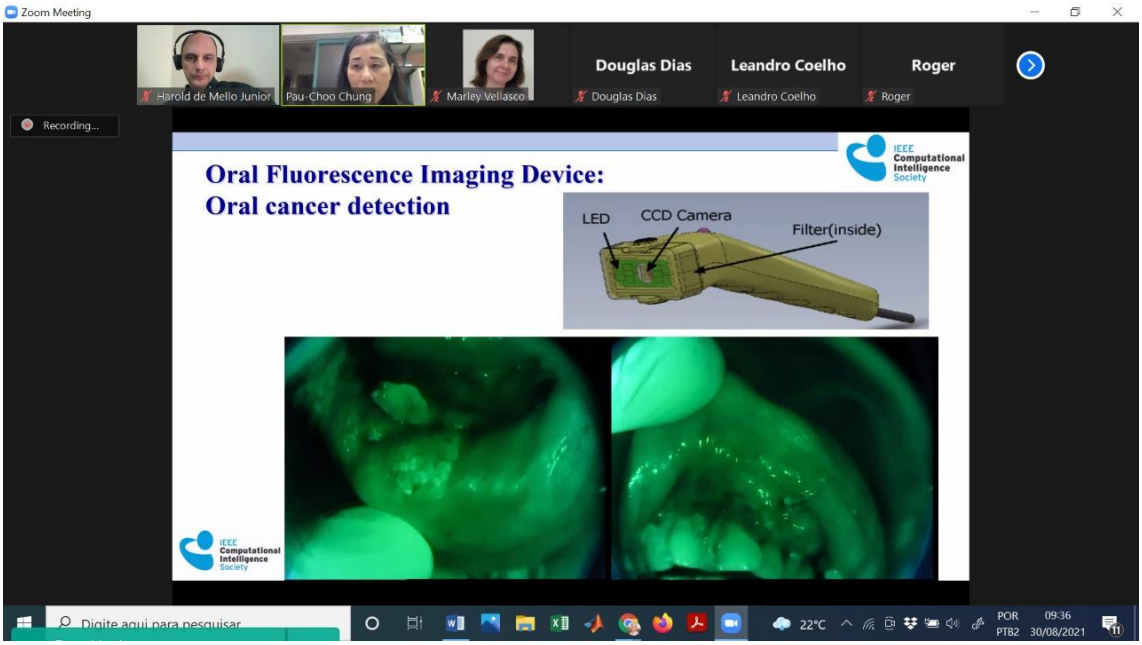
Zoom Meeting
Harold de Mello Junior
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Marley Vellasco
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Recording...
Oral Fluorescence Imaging Device:
Oral cancer detection
IEEE Computational Intelligence Society
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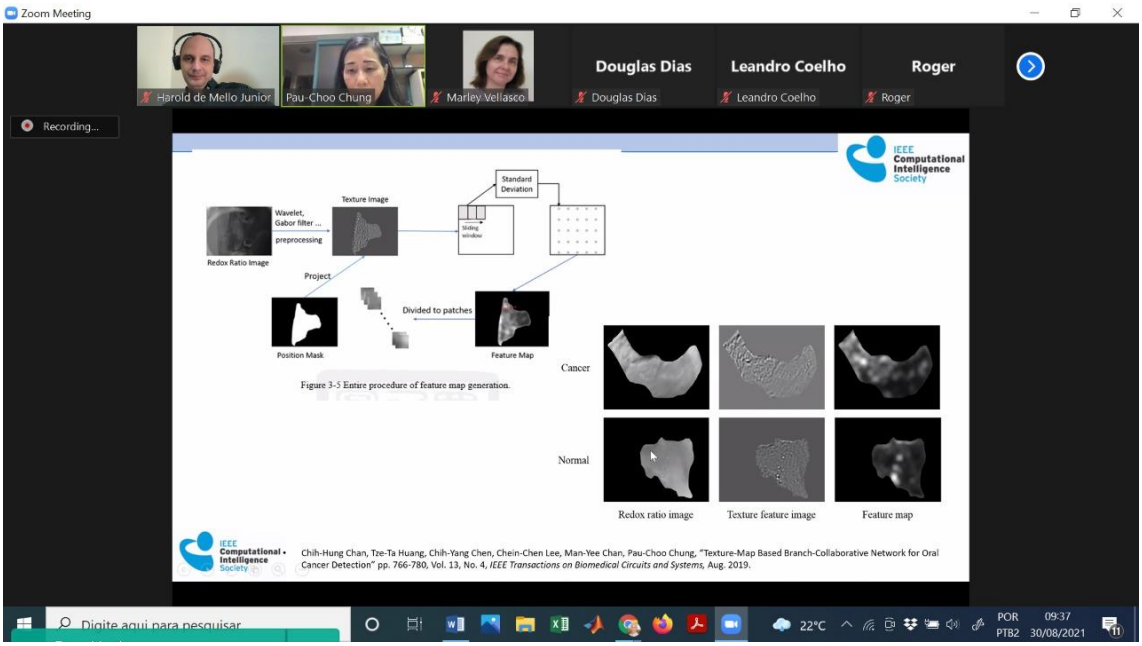
Zoom Meeting
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Douglas Dias
Douglas Dias
Leandro Coelho
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Recording...
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Standard Deviation
Texture Image
Wavelet, Gabor filter ...
preprocessing
Redox Ratio Image
Project
Divided to patches
Position Mask
Feature Map
Figure 3-5 Entire procedure of feature map generation.
Cancer
Normal
Redox ratio image
Texture feature image
Feature map
Chih-Hung Chan, Tze-Ta Huang, Chih-Yang Chen, Chein-Chen Lee, Man-Yee Chan, Pau-Choo Chung, "Texture-Map Based Branch-Collaborative Network for Oral Cancer Detection" pp. 766-780, Vol. 13, No. 4, IEEE Transactions on Biomedical Circuits and Systems, Aug. 2019.
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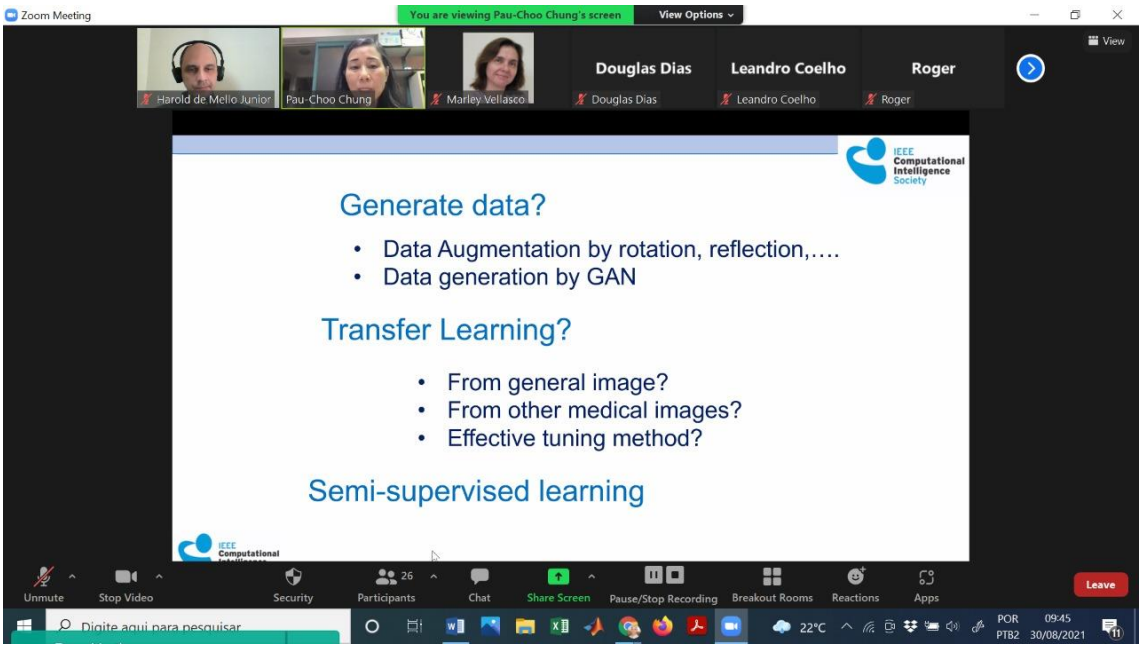
Zoom Meeting
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Harold de Mello Junior
Pau-Choo Chung
Marley Vellasco
Douglas Dias
Douglas Dias
Leandro Coelho
Leandro Coelho
Roger
Roger
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Generate data?
Data Augmentation by rotation, reflection,….
Data generation by GAN
Transfer Learning?
From general image?
From other medical images?
Effective tuning method?
Semi-supervised learning
Unmute
Stop Video
Security
Participants
26
Chat
Share Screen
Pause/Stop Recording
Breakout Rooms
Reactions
Apps
Leave
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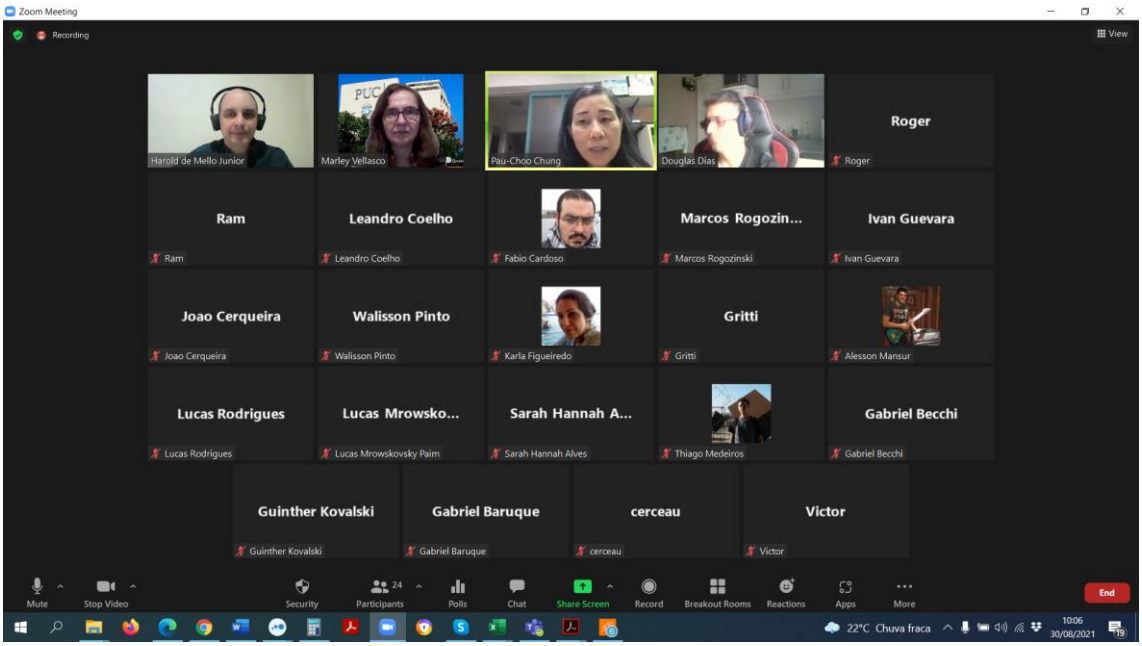

Printscreen at the end of Professor Julia talk