MSc(CS) Dissertation Public Seminar

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Title: AI Cartoon Character Generation with GAN

Speaker: Zhang Boyang

Date & Time: April 22 2020, Wednesday, 12:30pm

Zoom Meeting Link:
https://hku.zoom.us/j/93863193484?pwd=WnFJL3owUHkzdktJRlBHdmltSXVFZz09

Meeting ID: 938 6319 3484

Password: 448085

Abstract:

Generative Adversarial Network (GAN) have struggled for some years in the generation of high-quality anime faces, although they have achieved great success in real human faces. For the generation of anime face images with high-dimensional features, it is still a challenge for GAN. Recent research shows that progressive training and map network can improve the stability of the training for higher dimensional data and achieve better feature separation in the latent space, and it also can accelerate the training speed and generate higher resolution images. However, no one uses these GAN architectures for tag-based condition generation or category embedding. This dissertation explores the application of StyleGAN architecture to conditional generation and improves the image resolution of previous research.

About the Speaker:

Zhang Boyang is currently a full-time MSc(CS) student of the Department of Computer Science in the University of Hong Kong. His supervisor is Dr. Vincent Lau.

All are welcome!

Tel: 3917-1828 for enquiries

MSc(CS) Dissertation Public Seminar

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Title: Forensic Investigation of a Hacked Universal Robot

Speaker: Gong Yanan

Date & Time: April 22 2020, Wednesday, 01:15pm

Zoom Meeting Link:
https://hku.zoom.us/j/93863193484?pwd=WnFJL3owUHkzdktJRlBHdmltSXVFZz09

Meeting ID: 938 6319 3484

Password: 448085

Abstract:

Robots are going mainstream. Industrial robots play a key role in the environment of Industry 4.0. This generation of robots can be connected to the network and work together with humans. In addition to convenience, security risks have been increasing as data, systems and people are being connected digitally. These kinds of robots also provide hackers with more opportunities for attack. Hacked industrial robots will not only bring economic losses to manufacturers, such as damage to production lines, but also cause injuries nearby workers, even result in death.

In this paper, the author performed studies of the Universal Robots UR3, firstly identified the vulnerabilities of UR3, and built an attack model. Divided attacks into the network and physical attacks, according to the attackers' access level of the robot operating system. Then carried out these two types of attacks to the UR3 cobot separately. After that, a forensic investigation of the hacked robot was conducted. This process includes image acquisition and detailed data analysis.

The goal is to demonstrate a specific process of robot forensics and make some suggestions for the security of industrial robots as well as robot forensics.

About the Speaker:

Gong Yanan is currently a full-time MSc(CS) student of the Department of Computer Science in the University of Hong Kong. Her supervisor is Dr. KP Chow.

All are welcome!

Tel: 3917-1828 for enquiries

MSc(CS) Dissertation Public Seminar

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Title: Hacking and Forensics in UR3(CB31UR3)

Speaker: Wu Wencan

Date & Time: April 22 2020, Wednesday, 02:00pm

Zoom Meeting Link:
https://hku.zoom.us/j/93863193484?pwd=WnFJL3owUHkzdktJRlBHdmltSXVFZz09

Meeting ID: 938 6319 3484

Password: 448085

Abstract:

Universal Robot is a Danish company that mainly produces small flexible industrial collaborative robot arms. UR3(CB31UR3) is one of the serial productions in the company. UR3 is able to build connection to the Internet, which gives the access to the attacker to control it from the network. In this regard, to enhance the security and feasibility of forensics by building a forensics model becomes necessary. However only a few studies are related to Universal Robots forensics in forensics area. Consequently, in this research, we launched two types of network attack to hack the UR3 and we also accomplished the corresponding forensics investigation respectively. Based on these studies of network forensics of UR3, we make a novel conclusion of the useful parts with regard to network forensics on Universal Robots UR3.

About the Speaker:

Wu Wencan is currently a full-time MSc(CS) student of the Department of Computer Science in the University of Hong Kong. His supervisor is Dr. KP Chow.

All are welcome!

Tel: 3917-1828 for enquiries

MSc(CS) Dissertation Public Seminar

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Title: Data Visualization with VR Devices

Speaker: Zhao Peiyao

Date & Time: April 22 2020, Wednesday, 02:00pm

Zoom Meeting Link:
https://hku.zoom.us/j/98166950665?pwd=N2dnYkErcngrOTBJM0VIT2U4RjNSQT09

Meeting ID: 981 6695 0665

Password: 813695

Abstract:

Visualization is usually the crucial part in a data mining project. Using well-designed charts and graphs, users can draw potential insights from their data.

While visualization plays its role in data analytics, another popular territory, Virtual Reality (VR), is also widely applied in designing video games and 360 videos.

Some researchers may ask, what if we combine the two state-of-the-art fields? It sounds very interesting that if we could find somewhere in Data visualization that VR can step in.

To solve the question above, in this project, a user-friendly tool is created for data analysts from diverse background. Users may explore immersive data visualizations by themselves with the easiest and the most available tools, such as Google Cardboard as well as their own laptop and android mobile phones. Also, user experience is also collected and analyzed, the real practice and user study will imply some answers about what on earth virtual reality can offer to data visualization, as well as other useful discussions.

About the Speaker:

Zhao Peiyao is currently a full-time MSc(CS) student of the Department of Computer Science in the University of Hong Kong. Her supervisor is Dr. Vincent Lau.

All are welcome!

Tel: 3917-1828 for enquiries

MSc(CS) Dissertation Public Seminar

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Title: Data Visualization with VR/MR Devices

Speaker: Hao Miaohui

Date & Time: April 22 2020, Wednesday, 02:45pm

Zoom Meeting Link:
https://hku.zoom.us/j/98166950665?pwd=N2dnYkErcngrOTBJM0VIT2U4RjNSQT09

Meeting ID: 981 6695 0665

Password: 813695

Abstract:

In modern society, data is filling our daily lift little by little. So data visualization is playing an important part in analysis and forecasting in multiple domains. Data visualization is influencing development of science and technology by helping analysis. Science and technology is influencing the way we do data visualization in reverse. Virtual reality and mixed reality technology is examples. By virtual reality and mixed reality, there are more possibilities for data visualization.

This dissertation is talking about a system showing new possibility of data visualization. Visualization of data can not only provide insight, but also simulation experience with virtual reality and mixed reality.

The system is about weather and terrain of Hong Kong Island. It can get real-time weather and temperature information from Hong Kong Observatory. Instead icons in traditional weather visualization, the system simulates different weather effects in a three-dimensional environment. Terrain itself is holding data of three dimensions. Usage of VR and MR technology can about visualization of terrain data.

Temperature is visualized through the terrain, so that users can get distribution of temperature at Hong Kong Island.

About the Speaker:

Hao Miaohui is currently a full-time MSc(CS) student of the Department of Computer Science in the University of Hong Kong. Her supervisor is Dr. Vincent Lau.

All are welcome!

Tel: 3917-1828 for enquiries