

XTOP-2015

Mini-Conference Agenda



Date: Thursday January 15, 2014

Venue: Far East Telecommunications Building, Yuan Ze University

Room 70501

Time: 14:45 ~ 19:00

Website: <http://www.xiaotu.com/xtop>

Schedule at a Glance

Time	Name	Department	Title
14:45~15:00	Xiang You Xiao (蕭祥)	Photonics (光電)	TBA
15:00~15:15	Zhan Yu Wang (王占宇)	Photonics (光電)	TBA
15:15~15:30	Xuan Long Ho (胡春龍)	Photonics (光電)	Effect of Graphene in Quenching Fluorescence from Strained Conjugated Polymer Doped Polystyrene Film
15:30~15:45	Aray Po-Rui Chen (陳柏叡)	Photonics (光電)	Modifying Photoluminescence Emission from Thin Polymer Films through Local Deformation Zones
15:45~16:00	Amanuel Assefa (阿木繆)	Photonics (光電)	A modular chip based indoor visible light communication with LED
16:15~16:30	Charles Zhuo Chao Tu (涂卓超)	Photonics (光電)	TBA
Coffee Break (15 minutes)			
17:00~17:15	Amber Qiong Xin Zhang (張瓊心)	Information (資工)	PICO element detection in medical text without metadata
17:15~17:30	Shawn Xiang Lin Wen (溫祥麟)	Information (資工)	Depth-first Exploration for Systematic Testing of Android Apps
17:30~17:45	Jason Zhao Yuan Li (李肇元)	Information (資工)	Predicting Severity of Bug Reports using Implicit Tags
17:45~18:00	Tony Ying Hong Xu (徐熒宏)	Information (資工)	Towards More Accurate Retrieval of Duplicate Bug Reports
18:00~18:15	Jerry Jia Hui Lin (佳輝林)	Information (資工)	Testing of Memory Leak in Android Applications
18:15~18:30	Johnny Hong Yi Xiao (蕭弘益)	Electrical (電機)	Cryptographic System for Medical Image Security Using Chaotic APFM Nonlinear Adaptive Filter
Closing Ceremony (30 minutes)			

Abstracts

Modifying Photoluminescence Emission from Thin Polymer Films through Local Deformation Zones 透過改變高分子薄膜局部形變調整光致熒光

陳柏叡 / Po-Jui Chen

胡春龍 / Xuan Long Ho

白小明 / Jonathon David White

Controlling light extraction is important for applications ranging from LEDs to the weakly emissive thin films used for trace chemical detection. The commercial importance of GaN photodiodes, has resulted in the majority of work being concentrated on increasing light extraction efficiency (η) as GaN's high refractive index results in up to 96% of light being trapped and reabsorbed. Various methods, such as embedding photonic crystals and surface texturing, have been proposed and employed to improve η. Our focus is not on optimizing this quantity but rather on understanding the effect of surface modification on the angular, spatial and spectral characteristics of the emitted radiation. We do this by simulating the effect of a one-dimensional perturbation of thickness on the outputted radiation of a weakly absorbing fluorescent polymer film. While such a perturbation increases the η by a factor of two over a wide range of parameters, the film's other emission properties are quite sensitive to the surface structure. For instance, adjusting the spatial period, allows the spectral peak of the emission to be tuned over a 10nm range and the output to be localized in specific regions of the film. Adjusting the edge angle, allows one to fine tune the direction of radiation escaping the film. Finally, we will discuss tradeoff between structural parameters involved in optimizing light emission for specific detector geometries.

對發光二極體到化學檢測使用的弱放光薄膜應用，控制其光萃取是重要的。在商業上有種要用途的氮化鎵光電二極體，主要的研究專注在提升其光萃取效率。因為氮化鎵的高折射率會造成 96% 的光被侷限在元件內，然後被元件所吸收。因此，有透過嵌入光子晶體、表面紋理等方法，來提高光萃取效率。我們的研究專注在瞭解改變高分子薄膜表面紋理，使得發光角度、空間分佈還有光譜變化的性質。我們使用模擬分析弱吸收發光薄膜在表面加入溝槽後的發光特性。經由改變溝槽的結構參數，可以增加 兩倍。此外，我們發現除了發光效率外，其他的發光特性對調整結構參數非常敏感。例如，改變溝槽的出現的週期會使光譜有 10 奈米的位移，而且發光集中在薄膜的特定區域。如果調整溝槽的邊緣的傾斜角度，可以改變發光的方向。最後，我們討論如何取捨結構參數，以最佳化薄膜發光。

Key Words:

光萃取 / Light Extraction

光致熒光 / Photoluminescence

高分子 / Polymer

Effect of Graphene in Quenching Fluorescence from Strained Conjugated Polymer Doped Polystyrene Films 分析拉伸共軛高分子薄膜中石墨烯對熒光光漂白的影響

胡春龍 / Xuan Long Ho

陳彥豪 / Y. H. Chen

蒲念文 / N.W. Pu

楊長謀 / Arnold C. -M. Yang

白小明 / Jonathon David White

Introduction of graphene into films and solutions of conjugated polymers has been observed to dramatically quench photoluminescence (PL) of MEH-PPV. In other work, the PL of MEH-PPV well dispersed in an optically inert matrix was seen to be dramatically increased when the individual molecular strands were fully stretched. Strong polarization effects indicated that stretching individual polymer chains was responsible for the observed enhancement. We examine the combined effect of stress and the addition of reduced graphene oxide (rGO) on PL. We found that the addition of a small amount of rGO (0.3%) into polystyrene films lightly doped with 1% MEH-PPV quenched 40% of the PL. Stretching resulted in the creation of local deformation zones (LDZ) of high stress and strain. Within these zones, while the PL efficiency increased dramatically for all films, the effect was greatest for those incorporating rGO. We conclude that the application of stress on the conjugated polymers reduces charge transfer between the polymer and the graphene flakes.

本研究將介紹石墨烯在共軛高分子薄膜和溶劑中，對光致熒光光漂白的影響。其他研究提到 MEH-PPV 良好分散在光惰性基材裡，經由拉伸後可以大幅提升光致熒光。此外，強烈的偏極化指出此效應是透過拉伸孤立的高分子鏈才能夠有效增強。我們檢測拉伸應力與增加氧化石墨烯 (rGO) 數量對光致熒光的影響。我們發現增加小量的氧化石墨烯 (0.3%) 到參雜 1% MEH-PPV 的聚苯乙烯薄膜，能夠降低 40% 的光致熒光。拉伸此薄膜可以在薄膜上產生區域形變，此形變區高應力和應變。在含有參雜氧化石墨烯形變區裡，光致熒光效率有非常大幅度的提升。因此，透過應力能夠使共軛高分子有效降低高分子氧化石墨烯之間的電荷轉移。

Key Words:

氧化石墨烯 / rGO, MEH-PPV, 光致熒光 / photoluminescence

應力 / stress

Characterizing Defects Generated in Graphene by Scanning Probe Microscopy

白小明 / Jonathon David White

Graphene was prepared by chemical vapor deposition (CVD). Defects with differing topographical and tribological properties were then created by scanning probe lithography (SPL) under ambient conditions. The nature of these defect structures was then investigated by micro-Raman (μ -RS) and micro-X-ray photoelectron (μ -XPS) spectroscopy. Investigation of these structures suggests that, despite their physical differences, similar defects are present in both structures. In particular, μ -RS indicated that the ratio of the defect Raman peaks and the effective distance between defects had a similar magnitude and dependence on the applied bias voltage during SPL for all topographies. μ -XPS revealed no evidence of the generation of sp^3 -type defects. The small amplitude of the C-C peak and absence of C=O and C-OH peaks, suggest a complete absence of graphene oxide in the defect areas. We propose that a common active mechanism - bond reconstruction - is responsible for both structures.

PICO element detection in medical text without metadata

在醫學文件中若沒有後設資料，使用 PICO 方式僅萃取第一個句子是否足夠

黃可羣 / Ke-Chun Huang

蔣以仁 / I-Jen Chiang

蕭輔仁 / Furen Xiao

廖俊智 / Chun-Chih Liao

劉致和 / Charles Chih-Ho Liu

翁昭旻 / Jau-Min Wong

Efficient identification of patient, intervention, comparison, and outcome (PICO) components in medical articles is helpful in evidence-based medicine. The purpose of this study is to clarify whether first sentences of these components are good enough to train naive Bayes classifiers for sentence-level PICO element detection. We extracted 19,854 structured abstracts of randomized controlled trials with any P/I/O label from PubMed for naive Bayes classifiers training. Performances of classifiers trained by first sentences of each section (CF) and those trained by all sentences (CA) were compared using all sentences by ten-fold cross-validation. The results measured by recall, precision, and F-measures show that there are no significant differences in performance between CF and CA for detection of O-element. However, CA perform better for I-elements, in terms of recall and F-measures. For P-elements, CF have higher precision, but lower recall. CF are not always better than CA in sentence-level PICO element detection. Their performance varies in detecting different elements.

在醫療文章中，高效識別 PICO 元件有利於實證醫學。本研究的目的是闡明這些元件的第一個句子是否足夠為訓練單純貝式分類器進行句子層級的 PICO 元素決策。我們從 PubMed 中有任何 P/I/O 標籤擷取 19,854 與 RCT 相關的結構化摘要提供給單純貝式分類器進行訓練。我們使用 10 折交叉驗證來進行 CF 及 CA 的效能比較。通過召回率，準確率和調和平均數的結果表明，在檢測 O 元素的 CF 和 CA 之間的表現並沒有顯著差異。然而，I 元素中的 CA 在召回率方面和調和平均數表現得更好。對於 P 元素，CF 有較高的準確率，但較低的召回率。CF 並不總是比 CA 在句子層級的 PICO 元素的結果好。檢測不同元素的效能各不相同。

Key Words:

文字探勘 / Text mining

資訊檢索 / Information retrieval

自然語言處理 / Natural language processing

問答系統 / Question answering

資訊擷取/ Information extraction

實證醫學/ Evidence-based medicine

A modular chip based indoor visible light communication

阿木繆 / Kassa ,Amanuel Assefa

白小明 / Jonathon David White

/ Sau-Mou Wu

/Allen Xu

Light emitting diode (LED) lighting is used to save a lot of energy in indoor environments and outdoors. LED can also be used as an alternative to wireless communication. VLC allows for easy integration and expansion of secure communication on existing infrastructure. Visible light communication (VLC) is used to address the large demand created for the need of higher data

speeds. We are developing a chip based VLC communication module for a one direction transmission of data. Early investigations are promising but indicative of the large void in the supply of smaller and modular components. We have found that speed of transmission is controlled by components quality and LED radiated power in the transmitter. Performance and speed increase of transmission were limited with the slow response of LED lighting components.

Key words:

Visible light communication

Light Emitting diode (LED)

Lighting

Optical Wireless communication (OWC)

Cryptographic System for Medical Image Security Using Chaotic APFM Nonlinear Adaptive Filter

蕭弘益 / Hung-I Hsiao

A novel cryptographic system for enhancing medical image security using chaotic amplitude phase frequency model (APFM) nonlinear adaptive filter is proposed. We set nine parameters, initial values, and simulated time interval for APFM nonlinear adaptive filter to generate chaotic orbits, and design a cryptographic system which could encrypt the medical images (plain images) to cipher images whose histograms are uniformly distributed. Because the APFM nonlinear adaptive filter can produce chaos, the filter's three solutions: amplitude, frequency, and phase angle of the desired component could serve as a pseudo random number generator (PRNG) to design the cryptographic system. We use the proposed cryptographic system to encrypt medical images transformed into cipher images whose histograms present uniform distribution with nice cryptographic properties. Furthermore, our encryption algorithm can successfully pass the NIST SP 800-22a tests. The proposed cryptographic system is shown to possess good cryptographic properties and large secret key space which is enough to resist all kinds of brute-force attacks.

Key Word:

APFM nonlinear adaptive filter

Chaos theory

DICOM

Medical image security

NIST SP 800-22a.

Towards More Accurate Retrieval of Duplicate Bug Reports 對於錯誤報告獲取更高準確度的召回

徐燦宏/Tony Ying Hong Xu

In a bug tracking system, different testers or users may submit multiple reports on the same bugs, referred to as duplicates, which may cost extra maintenance efforts in triaging and fixing bugs. In order to identify such duplicates accurately, we propose a retrieval function to measure the similarity between two bug reports. It fully utilizes the information available in a bug report including not only the similarity of textual content, but also similarity of non-textual fields.

(在錯誤報告追蹤系統中，不同的使用者會對同一項錯誤做出多個回報，稱作重複。這在維護過程中會造成分派與修復的過程需要花費更多的時間。為了更明確的定義出此報告是否為

重複，我們使用了一召回函示來計算兩個報告間的相似度。這方法充分地使用了報告中所提供的資訊包括文字欄位與非文字欄位)

Depth-first Exploration for Systematic Testing of Android Apps

溫祥麟/Shawn Xiang Lin Wen

Systematic exploration of Android apps is an enabler for a variety of app analysis and testing tasks. However, Relying on end-users to conduct the exploration might not be very effective: we performed a 7-user study on popular Android apps, and found that the combined 7-user coverage was 30.08% of the app screens. To address these problems, we developed a strategy named Depth-first Exploration that mimics user actions for exploring activities and their constituents in a slower, but more systematic way. To measure the effectiveness of our techniques, we use activity coverage (number of screens explored). Experiments with using our approach on 25 popular Android apps including BBC News, Gas Buddy, Amazon Mobile, YouTube, Shazam Encore, and CNN, show that our exploration techniques achieve 59.39–64.11% activity coverage.

系統化探索是 Android 應用程式分析和測試的推動者。然而依賴終端使用者進行的探索可能不是很有效：我們進行了對時下流行的 Android 應用程序進行 7 個使用者的研究，發現 7 用戶的應用程式畫面覆蓋率總和為 30.08%。為了解決這些問題，我們開發了一個名為深度優先的探索策略。此探索方式模仿用戶操作，雖然探索在較慢，但為更系統化的策略。評估我們技術的有效性，我們使用活動覆蓋（螢幕探訪數）。實驗中使用我們的 25 時下流行的 Android 應用程序，包括 BBC 新聞、Gas Buddy、Amazon Mobile、YouTube 和 CNN、表明我們的勘探技術達到 59.39-64.11% 的活動範圍。

Testing of Memory Leak in Android Application (Android 程式記憶體洩漏)

佳輝林/Jerry Jia Hui Lin

Android applications run on mobile devices that have limited memory resources. Although Android has its own memory manager with garbage collection support, many applications currently suffer from memory leak vulnerabilities. These applications may crash due to out of memory error while running. Testing of memory leak can detect the vulnerability early. In this paper, we perform memory leak testing of Android applications. We first develop some common memory leak patterns specific to Android applications. Then, based on the patterns, we generate test cases to emulate the memory leak. We evaluated the proposed testing approach (denoted as fuzz testing) for a number of Android applications. The initial results indicate that the proposed testing approach can effectively discover memory leaks in applications. Further, implemented code often lacks exception handling mechanism for altered resources and failed invocation of memory management related API calls.

Android 運行在嵌入式裝置上，然而嵌入式裝置通常記憶體資源有限，即使 Android 目前有自己的記憶體回收機制，但仍然有許多 APP 有記憶體洩漏的問題，這個問題時常導致程式因此異常中止。在此我們將探討 Android 記憶體洩漏的程式特性，並用幾個測試案例探討如何避免記憶體洩漏。我們並針對幾個記憶體洩漏，設計了測試記憶體洩漏的程式。而在研究過程中我們發現，現今的 Android 應用程式在實作時，大多忽略考慮記憶體異常的錯誤處理機制。

TBA

涂卓超 / Charles Zhuo Chao Tu

Organic electroluminescent polymer material is a new type of functional materials and make a breakthrough progress in recent years. Compared with small organic molecules and other materials it has many advantages and unparalleled function. Firstly mentioned organic electroluminescent development history, details of the advantages and characteristics of the organic materials, especially organic polymeric material, then from the electroluminescent we discuss its light-emitting principle, and compared with OLED. Finally, we think some future prospects and development direction of the organic polymer material.

Predicting Severity of Bug Reports using Implicit Tags (利用隱含標籤機制來改進軟體錯誤報告嚴重性預測之研究)

高瑋辰 / Wei-Chen Kao

楊志全 / Chih-Chuan Yang

楊正仁 / Cheng-Zen Yang

李肇元 / Chao-Yuan Lee

For large-scale software projects, bug reports play an important role in software development and maintenance. While many bug reports may be received daily, the severity of the bug reports influences the fixing priority. In this research, we consider the abundant information embedded in tags, and propose a tagging mechanism to assign implicit tags to bug reports by calculating the report similarity. The experimental results show that the proposed tagging mechanism can improve the prediction performance in the most cases.

對於大型軟體專案而言，軟體錯誤報告在軟體開發與維護中扮演極為重要的角色。尤其每天都有需多錯誤報告產生，因此軟體錯誤報告的嚴重性將影響除盾的優先順序。在本研究中，我們考慮錯誤報告中的標籤資訊，計算軟體錯誤報告間的語意相似程度，來進行隱含是標籤的標註，進而提升嚴重性預測的效果。實驗結果顯示所提出的標註標籤機制，在多數的狀況中可以提升軟體錯誤報告之嚴重性預測效果。

Key Words:

錯誤報告 / Bug Reports

嚴重性預測 / Severity Prediction

標籤機制 / Tagging Mechanism

相似度計算 / Similarity Computation

Evaluation Sheets

Name of Presenter: _____ Your Name: _____

www.xiaotu.com/xtop		poor	avg		excel
		1	2	3	4 5
Comment	ABS Quality of abstract/viewgraphs				
	PC Content Organization/flow				
	G Grammar and pronunciation				
	TIME Within allocation (ideal 12')				
	FC 1. No Stumbling				
	2. good sentence flow				
	3. presentation can be heard				
	4. make eye contact (not read)				
	Fluency and Clarity Subtotal: 4				
	A D V A N C E D	1 Natural Body movements, gestures			
	2 Standing Straight				
	3 modulation of volume				
	4 friendly and sincere tone				
	5 reads the audience				
	6 avoids fillers/verbal ticks				
	7 no apologizing				
Advanced Subtotal: 7					
OTH	Is: Late Submission (x0.9)				
	ab: Poor Audience Behaviour (-max 10)				
	ch: Chairman bonus (+ max 5)				
Total = (ABS+PC+G+TIME+FC+ADVANCED)*st - ab + ch= /30					
Good		To improve			