WOCMAT 2009

Workshop on Computer Music and Audio Technology

第五屆國際電腦音樂與音訊技術研討會

時間 民國九十八年十月十八日（星期日）上午08：20至下午09：30
民國九十八年十月十九日（星期一）上午09：00至下午09：30

地點 於國立台灣大學博理館一樓國際會議廳舉辦

主辦單位：開南大學資傳系　指導單位：行政院國科會、教育部　策劃製作：曾興魁

協辦：國立台灣大學電機系、國立交通大學聲音與音樂學位學程、中華民國電腦音樂學會

台灣電聲音樂會

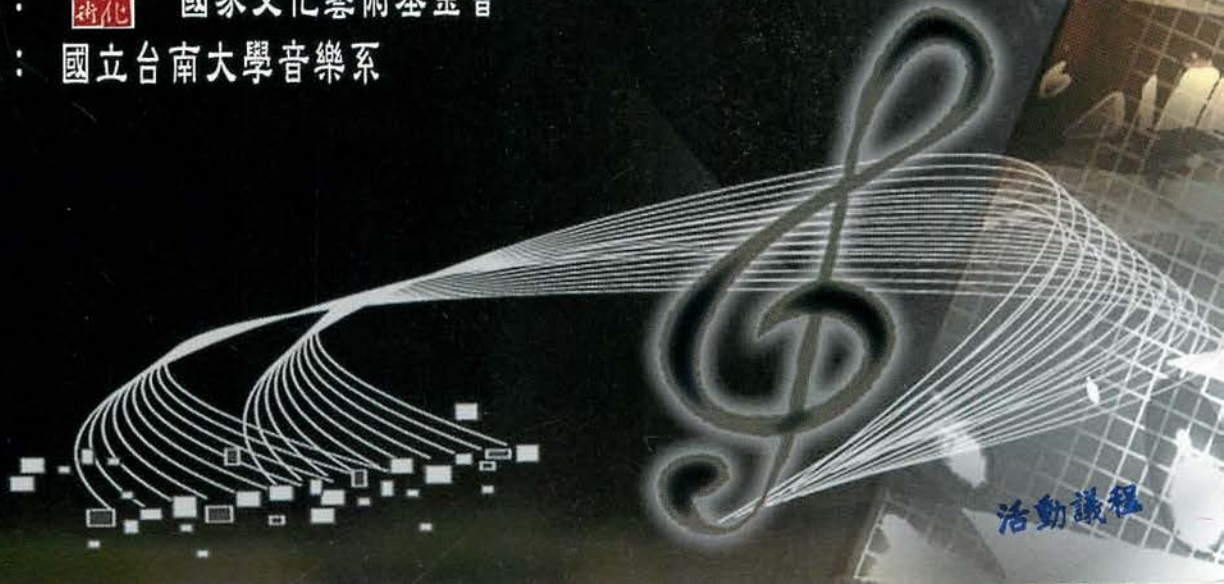
時間 民國九十八年十月十八日（星期日）至 民國九十八年十月二十日（星期一）

地點 國立台灣藝術教育館 南海劇場 、 國立台南大學 雅音樓音樂廳

主辦單位：中華民國電腦音樂學會　策劃製作：曾興魁、黃志方

指導單位： 國家文化藝術基金會

協辦單位： 國立台南大學音樂系



活動議程

WOCMAT 2009 國際電腦音樂與音訊技術研討會

2009 International Workshop on Computer Music and Audio Technology

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主辦單位 Organizer

開南大學資訊傳播學系
Department of Information Communications, Kainan University

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Department of Electrical Engineering, National Taiwan University

國立交通大學聲音與音樂創意科技碩士學位學程
Master Program of Sound and Music Innovative Technologies (S. M. I. T.), National Chiao Tung University

國立台南大學音樂系
Department of music, National Tainan University

音樂會主辦單位 Concert Organizer

中華民國電腦音樂學會
Taiwanese Computer Music Association (T. C. M. A.)

贊助指導單位 Sponsorship

行政院國家科學委員會
National Science Council of the Executive Yuan, Taiwan (ROC)

教育部
Ministry of Education, Taiwan (ROC)

國家文藝基金會
National Culture and Arts Foundation

大會時間地點 Date & Venues

2009/10/18–20

國立台灣大學博理館演講廳 (10/18-19 論文發表)
國立台灣大學博理館 201 會議室 (10/18-19 聲音藝廊電腦音樂播放)
國立藝術教育館 (10/18-19 台灣電聲音樂會)
國立台南大學雅音樓 (10/20 台灣電聲音樂會)
Conference Room, BL Building, National Taiwan University (10/18-19Conference Paper Presentation)
Room 112, BL Building, National Taiwan University (10/18-19 Sound Gallery)
National Taiwan Arts Education Center (10/18-19 Taiwanese Computer Music Concert)
Ya-Yin Concert Hall, National Tainan University (10/20 Taiwanese Computer Music Concert)

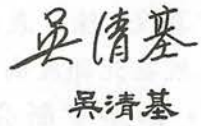
教育部長 賀詞

每年一屆的「國際電腦音樂與音訊技術會議」 (International Workshop on Computer Music and Audio Technology WOCMAT 2009) 深深的耕耘並提升了台灣的電腦音樂與音訊科技的水準，在此個人要對遠從美國 Oregan 大學來的 Jeffrey Stolet 教授、法國 Fredric Voisin 教授、德國舞蹈家 Robert Wechsler 先生、美國電子音樂演奏家 Bruce Gremo 先生、日本福島大學嶋津武仁教授來台灣給我們多場次的演講、研討會、音樂會現場表演，表示歡迎與敬佩之意，同時對國內各大學院校的教授、專家學者與音樂家們也感佩您們的辛勞。

數位科技與文化創意也是近年來教育部努力的重點，相信這次會議的成果，對台灣電腦音樂、音訊技術的提升必然帶來莫大的助益，並能突破近年來數位科技教育的瓶頸。

預祝這次會議順利、音樂會成功！

教 育 部 長



吳清基

第五屆國際電腦音樂與音訊技術會議

行政院文化建設委員會副主任委員洪慶峰

致詞

音樂是最原始的語言，歌聲帶給人的感動是無可比擬的，即使兩個語言不通的人，也能透過音樂來談情說愛。

從遠古農耕時代的「金石之音」，工業時代的「管弦之音」，到今日科技訊息時代的「電腦之音」；不同世代產出不同的聲源，成為我們共同記憶中的聲韻，「聲音」也在歷史上留下獨特的印證。

西元1750～1830年間幾位偉大的音樂家如：莫扎特、貝多芬、海頓等，締造了古典音樂無法超越的顛峰，讓後世望塵莫及。如今全球每五分鐘就有一個「新科技」被發明，在數位科技高度發達的推進下，「電音」成為現代音樂家的新樂器，帶給了現代音樂家挑戰莫扎特、貝多芬、海頓的可能與機會。可以預見「電腦音樂」勢必成為新音樂的基礎，新時代的動力。

趨勢大師大前研一先生，曾引用「哥倫布發現美洲大陸」的重要性，形容人類所開創的數位網際科技，如同一個無法衡量的新世界，虛擬世界顛覆著實體世界的所有規律與秩序。「電腦音樂」好比「概念車」，透過不斷的嘗試與突破經驗，締造出「新觀念」，「探索未來」成為它發展的價值。過去「音樂」的構成與產出，幾乎端賴樂譜及實體樂器而產生，現在學習或創作音樂不一定要懂得演奏樂器，許多擅長實體技術的音樂家，因為數位化應用趨勢，形成某種層面的障礙。過去的成功經驗不能等於未來的結果，舊思維總是不敵新潮流。

臺灣，一直是大華語地區流行音樂的發展中心；音樂，可以說是臺灣最具經濟產值的文化創意產業，不僅超越時地的侷限，更具備強烈的感染、滲透力。臺灣擁有不少高科技產業在世界上嶄露頭角，但是，高科技似乎並沒有帶動「電腦音樂」的發展。目前許多先進國家如：美國、法國、德國、日本、荷蘭等，還有中國大陸，在電子電腦音樂及音訊技術的發展都相當積極。

今天受邀出席「第五屆國際電腦音樂與音訊技術會議」，看見這麼多音樂界的前輩先進們，共同關注、激勵著臺灣「電腦音樂」的發展，感到相當喜悅。除了表示祝福與肯定外，順道向與會的所有貴賓報告，文建會已經在北部及南部進行設置兩處流行音樂中心。**「數位重新定義世界，知識重新分配財富」**，臺灣音樂產業如何持續維護領導地位，電腦音樂的發展成為關鍵因素。相信在大家的努力與高科技力量的支持，未來「電腦音樂」一定可以創造更亮麗的成績。

洪慶峰

主辦單位 歡迎詞

第五屆國際電腦音樂與音訊技術會議 (International Workshop on Computer Music and Audio Technology WOCMAT 2009) 今年很榮幸由開南大學資傳系主辦，並獲得國科會、教育部的資助，國立台灣大學電機系、國立交通大學聲音與學位學程、國立台南大學音樂系協辦，本人謹代表開南大學致上最誠摯的謝意，同時對遠從美國 Oregon 大學來的 Jeffrey Stolet 教授、法國 Montbéliard 音樂院 Fredric Voisin 教授、德國 Palindrome 舞蹈團總監 Robert Wechsler 先生、美國電子音樂演奏家 Bruce Gremo 先生、日本福島大學教授嶋津武仁教授來台灣給我們多場次的演講、研討會、音樂會現場表演，對台灣電腦音樂、音訊技術的提升必然帶來莫大的助益。對國立台灣大學慷慨出借場地，使研討會、音樂會方便順利進行，也致上感謝。

開南大學多年來努力提升教學、研究及對社會的服務，「國際化」與國際接軌也是我們努力追求的目標，希望藉由這次的會議及音樂會，使台灣電腦音樂與音訊技術能早日與歐美日本等先進國家並駕齊驅!

開南大學校長

高安邦

主辦單位的話

迎接互動藝術時代的來臨

～～ 以本文歡迎並感謝所有與會的學者專家、與會者

在多媒體藝術領域，常聽到「聲光的虛擬實境」，當法國物理學家傅立葉 (J. Baron de Fourier 1768～1830) 於 1822 年提出他的理論「任何複雜的聲波片段都可以以簡單的正弦波的總和來表達」時，可以說揭開了聲音分析合成的序幕。今天聲音合成的技術，透過取樣(Sampling)、物理模組合成 (Physical modeling synthesis)，任何樂器的合成幾可亂真 (差的那麼一點點實不能責咎於音色，而是發聲法 articulation!)。聲音樂傳播，透過我國中研院院士、諾貝爾物理獎科學家高錕光纖的發明真的是無遠弗屆； 數位影像壓縮技術的理論，也是我國物理學者陳文雄先生(曾任美國思科科技 Ciscos System 副總裁、資深研究員 Fellow、國際電子電機工程學會 IEEE Fellow, Vbits & Komodo Technology 公司創辦人) 於七零年代即率先提出，使今天影像聲音的傳播使天涯若比鄰，地球村的夢想得以實現! 法國人在這方面的研究始終名列前茅，筆者二十二年前(1987)在法國現代音樂與音響中心 (IRCAM)研究時，即看到他們聲音分析合成方面的成果，應用於幻象飛機的操控。台灣人才濟濟，電腦科技進步，若能整合出團隊來研究，實能自立自強不必事事仰人鼻息。

本週日開南大學資傳系在國科會、教育部與國藝會贊助，台大電機系、交大聲音科技學程。台南大學音樂系協辦下，不辭辛勞接下「第五屆國際電腦音樂與音訊技術研討會」與「台灣電聲音樂會」籌辦的工作，要呼籲迎接互動藝術時代的來臨！互動藝術由古典時期音樂家在台上的「默契」，發展為音樂家與聽眾的互動、音樂家與電腦人機界面的互動，美國電腦音樂家 Todd Winkler 定義為「音樂作品或即興藉由電腦軟硬體產生聲音或改變、詮釋現場的展演」(a music composition or improvisation where software interprets a live performance to affect music generated of modified by computer Composing interactive music MIT Press 1998) 點出科技在音樂表演中的角色。

這次的研討會與音樂會請到的外賓，如美國奧立岡音大學教授史托勒（J.Stolet）教授演講與音樂會均以現場的互動表演為主題，美國互動藝術家葛瑞莫（B. Gremo）帶來的自制的自動調控樂器「絨毛」(Cilia)，德國 Palidrome 舞蹈團藝術總監 (R. Wechsler)，將引進最先進的「影像追蹤」 (motion tracking)，法國 Montbéliard 音樂舞蹈戲劇學院教授 Fredric Voisin 帶來法國 IRCAM 先進的技術，聲音分析應用於音樂學的研究與輔助音樂創作，日本福島大學嶋津武仁教授以筆記型電腦在舞台上的即興演出，都是饒富趣味性、知識性與學術性的表演節目。

二十一世紀必將是聲光科技的時代，這不只是風花雪月藝術家象牙塔內自我陶醉的裝飾品，與民生、國防與科技工業也息息相關，如這次受邀專題演講(Keynote speech）舞蹈家 Robert Wechsler 在的著作「影像追蹤」中闡明「身為舞蹈家、編舞者，在我的作品中，我將電極體穿戴在身上來測量腦波、心跳節奏、骨骼肌肉的舒張及與表演者之間的皮膚相互接觸。此種皮膚表面所收到的低電壓，被放大並且送到電腦中，並重新映射到另一個媒體（如音樂、聲音樣本、影像等）」。他窮盡各種物理的感應器 (Sensor)如彎曲感應器 (bend)、加速感應器 (accelerator)、壓力感應器(fsr)，紅外線(infrared)追蹤與 Camera 的影像擷取等等於他的舞蹈演藝中。台灣有面板代工最大工廠，其原理其實只是隨壓力導電的橡板，紅外線的保全設施，幻象戰機的聲控輔助飛行與接戰操作，甚至到以聲音相位的反轉來減低噪音公害等，這些互動的科技若能在學術中紮根，工業上整合，那台灣將不再只是代工廠，而是核心科技的引領者，音樂家與工程師的對話，希望能為低迷的台灣迸出光芒萬丈的火花！

開南大學資傳系教授

中華民國電腦音學會理事長

曾興魁

Welcome the Era of Interactive Arts.

With this article, we appreciate all the distinguished guests, Prof. Jeffrey Stolet from University Oregon USA, Professor Fredric Voisin from Music and Dance Conservatory Montbéliard France, Dancer Robert Wechsler the Director of the German Palindrome Dance Group, Computer music expert Bruce Gremo from UAS, Professor Takehito Shimazu Fukushima University Japan and all participants.

In the field of multimedia arts, "the virtual world of sound and video" is frequently referred to. When the French physiologist J. Baron de Fourier brought up his theory in 1822 with which every complicated sound fragments can be represented by the sum of sine waves, he also started the prologue of sound analysis and resynthesis. Nowadays, through the technology of sampling and physical modeling synthesis, the synthesized sound can be almost the same as the acoustic one. (In fact the subtle differences between the two are not due to the timbre itself, but to the different articulation. The communication through sound and music is far-reaching with the invention of the optical fiber by our researcher Kung-Kung Kao from Academia Sinica, the Norbel Prize winner in Physics. The technology of video compression was also brought up in 1970s by Wen-Hsiung Chen, a physiologist of our country. (He was the vice president of Cisco System, American Senior Fellow, IEEE Fellow, and the founder of Vbits & Komodo Technology.) Today, the communication of audio and video brings a distant land near and make the dream of the global village come true. The French have always been the pioneer in this field. When I did my research in IRCAM 20 years ago (1987), I had already seen their fruitful outcome in audio analysis which was used to control the Phantom jet fighter. There is a wealth of talents in Taiwan and the computer technology is also advanced here. We will not have to rely on other countries any more if we could organize a research group in this field.

This Sunday, the department of Information and Communications at Kainan University spares no efforts to hold the fifth International Workshop of Computer Music and Audio Technology, and the Taiwan Series of Electro-acousitc Music Concerts, under the auspices of the Ministry of Education, National Science Council, National Culture and Arts Foundation, the Department of Electrical Engineering at National Taiwan University, the Program of Audio Technology at National Chao-Tung University. We are here to greet the era of interactive arts. The interactive arts have been developed from the unspoken consensus among performers on stage to the interaction between the musicians and the audience, and the interaction between musicians and computer. The American computer music composer Todd Winkler defines interactive music as "a music composition or improvisation where software interprets a live performance to affect music generated or modified by the computer." It points out the new role of technology played in music performance. (a music composition or improvisation where software interprets a live performance to affect music generated of modified by computer Composing interactive music MIT Press 1998)

In this workshop, we have invited some distinguished guests. J. Stolet from the College of Music at the University of Oregon in the United States will give a lecture in the workshop and present his piece at the night concert, both of which focus on interactive performance. The interactive artist B. Gremo from the United States will present his Cilia, a self-made automated music controller. The president of the Palindrome dance group from German will introduce the most advanced technology of motion tracking in their performance. Professor Fredric Voisin from the Montbéliard College of Music and Dance in France will introduce the advanced technology in IRCAM by using the audio analysis technology to assist the research on musicology and to facilitate music composition.

Professor 嶋津武仁 from Japan will also improvise his music with the laptop computer. All these performances are interesting, informative, and of great academic value.

The 21st century will be the era of audio and video technology. It is more than a private ornamentation of an artist in an ivory tower. It is closely related to the people's livelihood, national defense and technology industry. As is said by the choreographer Robert Wechsler, the invited lecturer in the Keynote speech, in his work "motion tracking":

In my work as a choreographer, I have used electrodes attached to the body to measure brain waves, the rhythm of the heart, skeletal muscle contractions and the skin-to-skin contact between performers. The low voltages picked up on the surface of the skin are amplified and sent to a computer where they are re-routed, so to speak, to other media -- music, sound samples, video images and so on. This is the body-oriented approach and it usually involves what to dancers are cumbersome wires and electronic devices strapped to the body.

He has tried various sensors such as the bend sensor, the accelerator sensor, and the fsr sensor, the infrared tracking, and the motion tracking of the camera in his dance performance. There is the largest panel OEM in Taiwan. In fact, the theory is nothing but a rubber plate which can conduct electricity with pressure, the infrared system for the preservation of facilities, the sound-controlled Phantom Airplane. Through the integration of the industry, Taiwan will be more than a foundry. It will become the pioneer in the most important technology. Through the exchange of ideas between musicians and scientists, we are hoping to bring glamorous sparks to the current flounder in Taiwan.

Shing-kwei Tzeng
Professor, Department of Information Communications,
Kainan University
Chairman of Taiwanese Computer Music Association

【主持人】
Session Chairs

※名單按主持場次順序排列。

高安邦校長 **Prof. An-Pang Kao**	開南大學 President, Kainan University
黃適卓副校長 **Prof. Shih-Cho Huang**	開南大學 Vice President, Kainan University
顏嗣鈞院長 **Prof. Hsu-Chun Yen**	開南大學資訊學院 Dean of Computer Science College, Kainan University
張智星 教授 **Jyh-Shing Roger Jang**	國立清華大學資訊工程學系 Department of Computer Science, National Tsing Hua University
王婷玉 教授 **Prof. Ting-Yu Wnag**	開南大學資訊傳播系 Department of Information Communications, Kainan University
朱育佑 教授 **Prof. Yu-Yu Chu**	開南大學資訊傳播系 Department of Information Communications, Kainan University
張鵬展 教授 **Prof. Peng-Chan**	開南大學資訊傳播系 Department of Information Communications, Kainan University
黃志方 教授 **Prof. Chih-Fang Huang**	元智大學資訊傳播學系 Department of Information Communication, Yuan Ze University
蘇文鈺 教授 **Prof. Wen-Yu Su**	成功大學資訊工程學系 Department of Computer Science and Information Engineering, NCKU
曾毓忠 教授 **Prof. Yu-Chung Tseng**	國立交通大學音樂研究所 Institute of Music, NCTU
趙菁文 教授 **Prof. Ching-Wen Chao**	國立台灣師範大學音樂系 Department of Music, National Taiwan Normal University

曾興魁 教授 **Prof. Shing-Kwei Tseng**	開南大學資訊傳播系 Department of Information Communications, Kainan University
沈錳坤 教授 **Prof. Man-Kwan Shan**	政治大學資訊科學系 Department of Computer Science, National Chengchi University
鄭士康 教授 **Prof. Shyh-Kang Jeng**	國立台灣大學電機系 Department of Electrical Engineering, National Taiwan University
古鴻炎 教授 **Prof. Hung-Yan Gu**	國立台灣科技大學資訊工程系 Department of Computer Science and Information Engineering
李忠謀 主任 **Prof. Greg C. Lee**	國立台灣師範大學數位媒體中心 Digital Multimedia Center, National Taiwan Normal University
羅基敏 教授 **Kii-Ming Lo**	國立台灣師範大學音樂系 Department of Music, National Taiwan Normal University
鄭建文 **Chien-wen Cheng**	華夏技術學院 Hwa Hsia Institute of Technology

議程表　10 月 18 日　星期日

台灣大學 10 月 18 日星期日　October 18,Sunday, 2009

Program	Chair	Place	Time
報到、註冊	籌備處	台大博理館前廊	08:00~08:40
開幕式 / Opening Ceremony	開南大學高安邦校長 黃適卓副校長	台大博理館演講廳	08:40-09:10
專題講座 1 / Keynote Speech 1 主講人 / Speaker：Robert Wechsler（美國藝術家、德國 Palindrome 舞蹈團總監） 主題：Motion Tracking in Live Performance	開南大學資訊學院院長顏嗣鈞教授		09:10~10:30
茶敘 / Break		台大博理館(Lobby)	10:30-11:00
第一場論文發表 / Paper Presentation I (三篇) 主題：多媒體互動 / Multimedia Interactions	張智星教授 / Prof. Roger Jyh-Shing Jang	台大博理館演講廳	11:00-12:00
午餐 、茶敘/ Lunch (餐盒)	籌備處 王婷玉教授 (謹提供貴賓及工作同仁)	博理館112 教室	12:00-13:20
聲音藝廊電腦音樂選播	開南大學 朱育佑、張鵬展教授/		二天
特約講座 1 /Invited Speech 1 主講人 / Speaker：Jeffrey Stolet 主題：Data to Actualization: Real-time Performance of Interactive Electroacoustic Music	黃志方教授	台大博理館演講廳	13:20-14:20
第二場論文發表 / Paper Presentation II (四篇) 主題：音訊處理 / Audio Signal Processing	蘇文鈺教授		14:20-15:40
茶敘/ Break		台大博理館前廊(Lobby)	15:40-16:00

特約講座 2/Invited Speech 2 主講人 Speaker：嶋津武仁(Takehito Shimazu 日本福島大學教授) 主題：由日本傳統藝術所構思之電腦音樂聲音材料與思考方式 Sound Materials and Ways of Thinking, Thoughts in Electronic and Computer Music, Getting from Traditional Japanese Art	曾毓忠教授/ Y. C. Tseng	台大博理館演講廳	16:00-17:00
晚餐	(謹提供貴賓及受邀同仁)		17:00-19:00
晚間音樂會 / Concert (1) (免費進場)	趙菁文教授	國立藝術教育館(南海路)	19:30-21:30

10 月 19 日星期一/ Oct. 19, Monday, 2009

Program	Chair	Place	Time
專題講座 2/ Keynote Speech 2 主講人 / Speaker：Prof. Dr. Fredric Voisin（法國 Montbeliard 音樂舞蹈戲劇學院） 主題：電腦應用於音樂分析 Computer Aided Musical Analysis : A « Morphological » Approach to Music Analysis	鄭建文教授 / C. W. Cheng	台大博理館 演講廳	09:00-10:20
茶敘 / Break		台大博理館 前廊(Lobby)	10:20-11:00
第三場論文發表 / Paper Presentation III (三篇) 主題：音樂資料處理 / Music Data Processing	沈錳坤教授 / M. K. Shan	台大博理館 演講廳	11:00-12:00
午餐 / Lunch	(謹提供貴賓及工作同仁)	博理館 112 教室	12:00-13:30
特邀講座 3 / Invited Speech 3 主講人 ／ Speaker：Bruce Gremo 主題：”絨毛”控制器的控制種類：運用 Max/MSP 的一些控制研究 Topic: Categories of Control in the Cilia Controller: Some Case Studies of Complex Control Routing Using Max/MSP	鄭士康教授 /S.K. Jeng	台大博理館 演講廳	13:30-14:30
第四場論文發表 / Paper Presentation IV (四篇) 主題：音樂資料檢索 (Music Information Retrieval)	古鴻炎教授 / H. Y. Gu		14:30-15:50
音樂家與工程師的對話 / Panel Discussion	李忠謀教授 Greg C. Lee / 羅基敏教授 K. M. Lo		15:50-17:00
晚餐（自備）/ Dinner (on your own)			
閉幕音樂會 / Concert (2) (免費進場)	曾興魁教授授 / S. K. Tzeng	國立藝術教育館 (南海路)	19:30-21:00

10 月 19 日~10 月 22 日邀請 Prof. Jeffrey Stolet、Prof. Frédric Voisin、德國 Palindrome 舞蹈團總監 Robert Wechsler 、嶋津武仁 (Takehito Shimazu)教授等四位學者進行與台大、師大、交大等校進行 Workshop 講座與學術交流活動。

※主辦單位保留議程與內容異動之權力

International Workshop on Computer Music and Audio Technology

Schedule

5th WOCMAT

Oct. 18, Sunday, 2009

Program	Chair	Place	Time
Registration	**Administration**	**Lobby BL Building, NTU**	**08:00~08:40**
Opening Ceremony	**A. B. Kao,** ***President /Vice President S.Z. Huang of Kainan Universiy***	**International Conference Center**	**08:40-09:10**
【Keynote Speech I】 **Speaker：Robert Wechsler (The supervisor of Palindrome Dancers, Germany)**	**Prof. S.G.Yen Dean of Kai-nan University**		**09:10~10:30**
Break (Audio Gallery)		**Lobby BL Building**	**10:30-11:00**
Paper Presentation I (3 Papers) **Topic:** Multimedia Interactions	**Prof. J.S. Roger Jang**	**International Conference Center**	**11:00-12:00**
Audio Gallery		**Lobby BL Building**	**During the Conference 2 days**
Lunch (Lunch Box)	**Prof. Ting-Yu Wang**	**BL Building 112 Conference Room**	**12:00-13:20**
Invited Speech I **Speaker：Jeffrey Stolet (Prof. of University of Oregon, USA)** ***Real-time Performance of Interactive Electroacoustic Music***	**Prof. Chih-Fang Huang**	**International Conference Center**	**13:20-14:30**

Paper Presentation II (4 Papers) **Topic: Audio Signal Processing**	**Prof. W. Y. Su**	**BL Building**	**14:20-15:40**
Coffee Break		**Lobby** **BL Building**	**15:40-16:00**
Invited Speech II / Speaker： (Takehito Shimazu Professor of Fukushima University , Japan) **Topic:** " Sound materials and Ways of thinking, Thoughts in Electronic and Computer Music, getting from Traditional Japanese Art "	**Y. C. Tseng**	**International Conference Center**	**16:00-17:00**
Dinner	**(on your own)**		**17:00-19:00**
Concert (1)	**Prof. Ching-Wen Chiao**	**Taiwan Art Education Center (Nanhai Road)**	**19:30-21:30**

Oct. 19, Monday, 2009

Program	Chair	Place	Time
Keynote Speech II Speaker：Prof. Dr. Fredric Voisin（Conservatoir, de musique, de danse et d'art Dramique, France） *Topic: Computer Aided Musical Analysis : A « Morphological » Approach to Music Analysis*	C. W. Cheng	BL Building	09:00-10:20
Break			10:20-11:00
Paper Presentation III **Topic: Music Data Processing**	Prof. Man-Kwan Shan		10:50-12:00
Lunch	(VIP / Staffs Only)	BL Building 112 Conference Room	12:00-13:30
Invited Speech III **Speaker: Bruce Gremo (American interactive art expert)** **Topic: Categories of Control in the Cilia Controller: Some Case Studies of Complex Control Routing Using Max/MSP**	Pro. S.K. Jeng	BL Building	13:30-14:30
Paper Presentation IV **Topic: Music Information Retrieval**	Prof. Y.H. Gu		14:30-15:50
Panel Discussion	Prof. C. M. Lee / Prof. G.M. Luo		15:30-17:00
Dinner	(on your own)		
Concert (2)	Prof. S. K. Tzeng	Taiwan Art Education Center (Nanhai Road)	19:00-21:00

October 19~22, we invite Prof. Jeffrey Stolet, Prof. Frédric Voisin, Mr. Robert Wechsler, Mr.Bruce Gremo and Prof. Takehito Shimazu to National Taiwan University, National Taiwan Normal University, and National Chiao Tung University for workshops and lectures as the extended academic activities.

【專題演講人】
Keynote Speaker

Robert Wechsler

Robert Wechsler is a dancer and choreographer living in Germany. He is artistic director of Palindrome Intermedia Performance Group and is an experimenter with interactive ways of performing using new technology. His interest in sensors and electronic devices dates back to the 1970s when he used hand-held electronic devices to generate sounds through his movement on stage. This was in Ames, Iowa, in the United States where he studied molecular genetics. A move to New York City and a ten-year dance training (S.U.N.Y. Purchase, Merce Cunningham, Maggie Black, et al.) did little to lessen his interest in science and in 1982 he formed Palindrome with a group of scientists and artists at New York University.

In 2004, Wechsler designed and directed England's first masters degree program in digital performance at Doncaster College. He is the author of articles concerned with dance and new media for Leonardo Magazine, IEEE Technology and Society Magazine, Ballet International, Dance Magazine, *Dance Research Journal*, Nouvelle de Danse, Der Tanz der Dinge and others and presents work regularly at scientific conferences concerned with the technology, culture and art. His first book, "Motion Tracking -- a practical guide for performing artists" is scheduled for publication in 2008.

【專題演講人】
Keynote Speaker

Fredric Voisin

Researcher and musician, Frederic Voisin studies musicology at Paris - Sorbonne University, inuit language at INALCO, semiology at EHESS... Pioneer of musical computing, he develops since nineteen eighty nine, in Central African Republic and Indonesia, with Simha Arom at CNRS, the first interactive ethnomusicology experiments by digital audio synthesis. In nineteen ninety five, he integrates into IRCAM as computer music producer, and takes part in a lot of live music performances, with Art Zoyd, CIRM, composers, choreographers and directors : Daniel d'Adamo, Jean-Baptiste Barrière, Maurice Benayoun, Allain Gaussin, Heiner Goebbels, Myriam Gourfink, Peter Greenaway, Jean-Luc Hervé, Atli Ingolfsson, Philippe Leroux, Martin Matalon, Emmanuel Nunes, Rachid Ouramdane, François Paris, Terry Riley, Roger Reynolds, Fausto Romitelli, Atau Tanaka, Kasper Toeplitz, Giovanni Verrando, Iannis Xenakis... Since 2000, he devotes to the study and musical applications of neural networks (neuromuse project). Between art and science, his last researches are often presented, notably with composer Robin Meier, at time of experimental concerts and installations : "Caresses de marquises", Nuit Blanche - Paris 2004 ; "Symphonie des machines", Sophia Antipolis 2006... Since 2007, he is teachning computer music at the University and at Conservatoire de Musique, de Danse et d'Art dramatique du Pays de Montbéliard.

【特約演講人】
Invited Speaker

Jeffrey Stolet

Jeffrey Stolet is a composer, performer and currently a Philip H. Knight Professor of Intermedia Music Technology at the University of Oregon. Stolet was born in Aguadilla, Puerto Rico. He received his early musical training from stern and serious piano teachers who exploded in rage when he corrected Mozart's piano sonatas. Stolet went on to complete a Ph.D. in Music at The University of Texas at Austin.

Stolet's work has been presented around the world and is available on the Newport Classic, IMG Media, Cambria, SEAMUS and ICMA labels. Presentations of Stolet's work include major electroacoustic and new media festivals such as the International Computer Music Conference, the Society for Electro-Acoustic Music in the United States Conference, the MusicAcoustica Festival in Beijing, the Annual Electroacoustic Music Festival in Santiago de Chile, the Florida Electroacoustic Music Festival, SIGGRAPH, the transmediale International Media Art Festival, Boston Cyber Arts Festival, Cycle de concerts de Musique par ordinateur, the International Conference for New Interfaces for Musical Expression and the International Electroacoustic Music Festival "Primavera en La Habana," in Cuba. In addition, his work has been presented in diverse venues such as the Museum of Modern Art in New York, the Pompidou Center in Paris, and the Center for Computer Research in Music and Acoustics at Stanford University. Stolet's recent work has centered on performance environments where he uses a variety of wands, sensing devices, game controllers and other magical things to control the sonic and videographic domains. In addition, Stolet has collaborated with The New Media Center at the University of Oregon to transform an original electronic music textbook into *Electronic Music Interactive*, an Internet deliverable, multimedia document containing motion animations, sound, and glossary that has received rave reviews in the press (*Electronic Musician*, *Keyboard Magazine*, *The Chronicle of Higher Education*, and *Rolling Stone Magazine*).

【特約演講人】
Invited Speaker
Takehito Shimazu
嶋津武仁

Was born in 1949, Japan. He studied composition with Prof. Sesshu Kai (in Tokyo), with Prof. Isang Yun (in Berlin) and others. He produced electronic and computer music at the electronic studio of the Technical University of Berlin (**TU-Studio Berlin**), at **IRCAM** in Paris, at **Les Ateliers UPIC**/Paris (now CCMIX, Center of Computer Music I.Xenakis) and INA-GRM in Paris/France. His activities as Composer (and as Conductor) spread widely from Japanese Traditional Dance, Modern dance, Multi-Media, Performing-Arts and Music for Solo, Ensemble, Chorus to Orchestra Music.
Participated at:

He took part in the concert series "**Stimmen**","**Inventionen**" in Berlin (1978-81)
The Summer Seminar for new music in Darmstadt/Germany (1980)
The International Experimental Music Festival in Bourge/France (1980,81)
The ACL Pan-pacific Asian Music Festival in Philippines (1991)
ISCM(International Society of Contemporary Music) in 82(Graz/Austria), in 88(Hong Kong) and in 93(Mexico-city), a commission work of **ISCM** in 90(Oslo).
ICMC (International Computer Music Conference) in 88 (Cologne) and in 93 (Tokyo), in 96 (Hong Kong).

Pan Music Fest.in Seoul/ Korea(1984,86)
" **Japan Today in Scandinavia** " in Stockholm/Sweden(1990)
Saarbrucken Music-Fest. in Saarbrucken/Germany (02),
Dresden Music-Fest. In Dresden/Germany (05),
Chamber Music festival in Wroclaw/ Poland (06) ,
And any other festivals in Asia and Europe.

Prizes:
Jurgen-Ponto Composition Competition/Germany (79)
The International Wieniawski Composition Competition/Poland (80)
The Special Prize of Japanese Culture Ministry for Theater Arts/Japan (88)
The International Experimental Music Composition Competition in Bourge/France (96)

The music committee chairman of **ICMC'93** Tokyo.
Now he is **Professor** of **Fukushima University** in Japan.
The Art Director of the Fukushima Orchestra Pfirsich.

Published Scores:
Deutscher Verlag für Musik Leipzig (DVfM) and Breitkopf & Härtel in Germany

New publishing CD:
CCMIX Paris, Xenakis UIPC Continuum, mode 98/99, NY/USA

【特約演講人】
Invited Speaker

Bruce Gremo

Composer-performer instrument-maker Bruce Gremo has written interactive computer music since 1997, and has performed worldwide. Received awards include the Interactive Technology Artist in Residence Award at Harvestworks, NYC, where he co-invented the Cilia, an electronic flute controller. He was a 2004 Fellow in the Creative Artist Exchange program, a NEA supported award that enables study and work in Japan for six months. He was Composer in Residence at Civitella Rainieri Foundation in Italy in 2003. Recipient of a NYFA Fellowship in Music Composition (2002), featured composer at New York venues Experimental Intermedia, Roulette, Harvestworks and Lotus Studios, he was also Artist in Residence at Steim (Amsterdam, 9/2002), Engine 27 (NYC, 5-6/02) and Harvestworks (2000).

A classical flutist, he also performs on the Japanese Shakuhachi, the Chinese Xun and others. He has been a soloist at numerous festival; Lincoln Center Festival, Wien Modern, the BBC Proms Festival, the Knitting Factory Jazz Festival under Ornette Coleman's direction, the Charlie Parker Jazz Festival with Butch Morris. From 1990 to 2000, he collaborated with Chinese composer Tan Dun as improviser, music director, synthesizer programmer, soloist and conductor. He toured over 14 months as synthesizer programmer and EWI soloist with the Peter Sellars production of The Peony Pavilion. Currently residing in Beijing, he works as composer, principle flutist with the orchestra XinYaKongQi, free-lance chamber flutist and recitalist, and studio multiple-flutist.

His work joins improvisation and interactive computer programming. Having emerged out of a graduate academic composition environment, he has also participated in the downtown free improvisation scene in New York since the early 90s uintil he relocated to China in 2006. The computer is central to most of his composition formats. These formats are oriented towards live performance.

"Interactive computer pieces have been my focus since around 1998. They are both score and instrument, as well as application. Many are conceived to enable acoustic soloists to control computer generated sound using only the musical means available on their instruments. This involves analyzing the acoustic instrument input, deriving continuous control from the analysis, and implementing it in controlling sound generating processes."

He completed Masters in Composition (Martin Bartlett) and in Philosophy (Reiner Schurmann), and has taught at the New School, NYC ("Truth and Music," at the New School, NYC, 1993).

專題演講摘要

Lecture Abstract

Robert Wechsler

主題：運動追蹤應用於現場演奏

Topic: Motion Tracking in Live Performance

Human motion is the source of all music. Particularly when a live performer is involved, the rhythmic and controlled contraction of muscles, its kinesthetic and physical (sound generating) properties lie at the heart of this art form. Its expression comes to us both aurally and visually and in the psychology of human perception, it is not always clear where one stops and the other begins. This overlap, or confusion of the senses is known as synesthesia and can play a central role in how music is experienced.

Motion Tracking means using sensors to gather data on human motion. The data can then be used to generate sounds or influence composed music in myriad ways. This "interactive" way of combining movement and music leads to many questions concerning the roles of the creators and performers, as well as the very meaning of performance, dance and music.

In performing interactive pieces, a structure must be found which allows compositions to be partly fixed and partly flexible. In the beginning we found ways to start and stop samples and influence their volume and pitch through performer gesture. Since ca. 2000, realtime digital signal processing has allowed us subtler and more expressive alternatives.

Two questions stand out: What do you control, and how do you control it? In other words, what parameters of sound composition do you give to the performer, and what physical gesture or changes in the performer's body do you use to control those parameters? While these questions are paramount, there is little go by and the results are hard to predict. Most of the possibilities that come to mind fail to give an intuitive or expressive result. Some, however, work brilliantly. The reasons for this are just beginning to be understood.

This talk with video excerpts is by a choreographer and dancer (not a composer or musician). He has worked with electronics and movement-controlled music since 1974 in the areas of dance, music, installation art and opera. He will present perspectives and future visions concerning interactive performance and the human body interface.

Fredric Voisin

主題：電腦應用於音樂分析

Topic: Computer Aided Musical Analysis : A « Morphological » Approach to Music Analysis

Based on his experience in ethnomusicology and computer music productions, Frédéric Voisin is presenting and developing concepts, methods and tools to represent, analyze and synthesize sound and music into different software environments (OSX, Unix, MS-Windows): presentation of different ressources (free and non-free) in computer sound and music analysis (OpenMusic, PWGL, Audiosculpt, MaxMSP, Puredata, Praat, Melodyne, ...) ;pragmatical introduction to the computer human interfaces and languages ;computer transcription of sound and music; classification of sound and music features ;semi-automatic transcription of music; sound/music representation and digital formats; analysis *vs.* Resynthesis ;

Bruce Gremo

Lecture Topic: Categories of control in the Cilia controller: some case studies of complex control routing using Max MSP

The Cilia is a new electronic 'flute controller.' In its development, it aspires to the status of a solo-concert instrument. An underlying design issue is therefore how make it capable of a degree of complexity and nuance analogous to what one would expect in a typical acoustic flute. From within a larger problematic, one important guiding premise is that the solution is found through complex multiple referencing controllers. The premise seeks its justification in an analysis of the control dimension in acoustic performance practice. Hence, acoustic concert instruments function as a design paradigm. In this presentation, I will focus on an exposition and demonstration of some of these routines as implemented using MaxMSP. The control categories break down into three: direct control, dynamic control and networked control.

Jeffrey Stolet

主題：電腦應用於音樂分析

Topic: Data to Actualization: Real-time Performance of Interactive Electroacoustic Music

Real-time interactive performance of electroacoustic and computer music using nontraditional instruments offers daunting challenges and exciting opportunities. Rather than depressing keys of a piano or plucking strings of a violin to perform music, music is produced and controlled in real-time by creating data streams that actuate musical events (such as notes, chords and rhythms) or expressively control musical spectra or dynamics. The concept of *data to actualization* – where data is remapped from an originating source to a musical destination – is the essential consideration of real-time

electroacoustic performance. This lecture will examine how different data sources generate differing data streams, that these data streams have different aesthetic potential, and that care must be given to directing these data streams to appropriate musical parameters. To illustrate the creative potential of different data sources musical examples that employ infrared sensors, video game controllers, common office devices, and flashlights will be resented.

嶋津武仁 (Takehito Shimazu)

主題：由日本傳統藝術所構思之電腦音樂聲音材料與思考方式

Sound Materials and Ways of Thinking, Thoughts in Electronic and Computer Music, Getting from Traditional Japanese Art

At first, ways of thinking of the Japanese composers who have been employed Japanese Traditional music into their works will be explained, using sound and visual data. And then, some useful sound materials for contemporary music gotten from Traditional Japanese Arts in the Lecturer's works will be introduced.

Through this speech, some possibilities in the field of electronic and computer music for Asian composers would be raised.

Bruce Gremo

主題："絨毛"控制器的控制種類：運用 Max/MSP 的一些控制研究

Topic: Categories of Control in the Cilia Controller: Some Case Studies of Complex Control Routing Using Max/MSP

The Cilia is a new electronic 'flute controller.' In its development, it aspires to the status of a solo-concert instrument. An underlying design issue is therefore how make it capable of a degree of complexity and nuance analogous to what one would expect in a typical acoustic flute. From within a larger problematic, one important guiding premise is that the solution is found through complex multiple referencing controllers. The premise seeks its justification in an analysis of the control dimension in acoustic performance practice. Hence, acoustic concert instruments function as a design paradigm. In this presentation, I will focus on an exposition and demonstration of some of these routines as implemented using Max/MSP. The control categories break down into three: direct control, dynamic control and networked control.

論文發表議程　10月18日星期日　台大博館演講廳

Paper Presentations, October 18 (Sun), BL Building, National Taiwan University

10:50–11:50

論文發表一：多媒體互動

Session I: Multimedia Interactions

主持人：張智星

Chair: Jyh-Shing Roger Jang

1. 曾于恬、鄭泗東,〈基於中階特徵表示法之音訊信號旋律萃取研究〉(10: 50 – 11: 10) [w-013]

2. 張淑惠、林廷嶸、劉宗慶,〈互動式動作控制音樂旋律產生器〉(11:10 – 11:30) [w-001]

3. Yi-Hsuan Yang and Homer H. Chen, "iMR- Interactive Music Recommendation via Active Interactive Genetic Algorithm" (11:30 – 11:50) [w-006]

14:20–15:40

論文發表二：音訊處理

Session II: Audio Processing

主持人：蘇文鈺

Chair: Wen-Yu Su

1. Chao-Liang Hsu and Shyh-Kang Jeng, "AN IMAGE RETRIEVAL SYSTEM USING MUSIC AS QUERY" (14: 20 – 14:40) [w-002]

2. Chung-li Lu and Shyh-Kang Jeng, "AUTOMATIC GENERATION OF ACCOMPANIMENT FOR A JAZZ PIANIST" (14:40 – 15:00) [w-003]

3. Yen-Ting Chen and Shih-Heng Pan, "iComper AN INTERACTIVE DRUMMERUSING HMM-BASED MUSICAL SIGN DETECTOR" (15:00 – 15:20) [w-005]

4. Zhi-Yan Lin and Shyh-Kang Jeng , "IMPLEMENTATION OF A VIRTUAL DJ SYSTEM ON EMBEDDED SYSTEM" (15:20 – 15:40) [w-007]

※主辦單位保留議程與內容異動之權力

The organizer reserves the right to change the program.

論文發表議程　10 月 19 日星期一　台大博理館演講廳
Paper Presentations, October 19 (Mon), BL Building, National Taiwan University

11:00–12:00
論文發表三：音樂資料處理
Session III: Music Data Processing

主持人：沈錳坤
Chair: Man-Kwan Shan

1. 吳宜蓁，〈電聲音樂創作技法探討〉(11:00 – 11:20) [w-008]

2. 黃志方、周宜瑩、王鶴雄、李宏儒，〈自動化數字簡譜產生系統研究〉(11:20 – 11:40) [w-009]

3. 廖琳妮，〈天倪在電子混合音樂中的音樂思想和語言〉(11:40 – 12:00) [w-004]

14:30–15:50
論文發表四：音樂資料檢索
Session IV: Music Information Retrieval

主持人：古鴻炎

Chair: Hung-Yan Gu

1. 林子翔、陳韋臣、廖怡欽，〈快速分群式音樂檢索方法〉(14:30 – 14:50) [w-010]

2. 謝雲凱、傅俊傑、鄭泗東，〈音樂情緒分類辨識與音色語句表示法研究〉(14:50 – 15:10) [w-014]

3. 柯舒方、沈錳坤，〈音樂風格自動改編系統〉(15:10 – 15:30) [w-011]

4. 傅俊傑、鄭泗東，〈基於頻譜質心變化之演算法的音樂訊號節奏速度萃取研究〉(15:30 – 15:50) [w-012]

論文摘要 Paper Abstracts

10/18 11:00–12:00 論文發表一：多媒體互動　主持人：鄭士康
Session I: Multimedia Interactions　Chair: Shyh-Kang Jeng

1. 曾于恬、鄭泗東，〈基於中階特徵表示法之音訊信號旋律萃取研究〉
旋律、節奏、和聲是構成音樂的三大要素。在開發音樂資訊檢索系統時，如何從訊號中萃取出音樂感知特徵是一大挑戰。本文將探討應用數位訊號處理技術，設計從音樂信號中萃取音樂主要旋律之演算法，模擬人腦在聽到音樂時對於音高的感知。本文的研究中，最大的課題是要如何從經過多音軌混音之音樂樂訊號中篩選出主要旋律的音高，因此分為三個步驟(1)篩選出音樂中主要聲部；(2)估算其基頻；(3)平滑旋律線，以計算出之音符時間長度修正各別音框中計算有誤之音高。實驗得到整體正確率 41.06%，單一歌曲旋律最高正確率可達 85.09%。

2. 張淑惠、林廷嶸、劉宗慶，〈互動式動作控制音樂旋律產生器〉
本論文主要是研究如何做出互動式音樂，利用壓電加速度感測元件將人之動作(如拍手)，感應成μs 級寬度的脈波訊號做無線傳輸。接收端將脈波訊號連接到 IC8951 所設計的旋律器，以達到由人本身打節奏的快慢，來控制音樂產出的旋律。此種設計可應用在娛樂或兒童音樂互動學習上，以建立正確的節奏。

3. Yi-Hsuan Yang and Homer H. Chen, "iMR- Interactive Music Recommendation via Active Interactive Genetic Algorithm"
The success of a music recommendation (MR) system heavily relies on its ability to identify user needs. Existing approaches, including collaborative filtering and contentbased methods, overlook the fact that user needs is inherently subjective and largely time-variant. In this work, we propose an interactive MR system (iMR) to tackle these issues. A user is asked to provide his/her preference for a number of songs, and then the feedback is exploited to learn the user needs. This way, the MR system is optimized for the user on the fly. To relieve user fatigue, the active interactive genetic algorithm is utilized in the learning process of user preference. In addition, to increase the hit rate, the songs awaiting for user evaluation are selected by the k-means algorithm. Experimental result demonstrates the efficacy and efficiency of the proposed system.

10/18 14:20–15:40 論文發表二：音訊處理　主持人：蘇文鈺
Session II: Audio Signal Processing　Chair: Wen-Yu Su

1. Chao-Liang Hsu and Shyh-Kang Jeng, "AN IMAGE RETRIEVAL SYSTEM USING MUSIC AS QUERY"
In this paper, a novel image retrieval approach is proposed. Different from traditional image retrieval approaches, which generally retrieve images using

keywords or example images as query, the image retrieval system proposed allows the user to search for images using music as query. Namely, a music-image cross-media retrieval system is developed. There is rich textual information associated with music and image on the web, and the textual information is used to bridge the semantic gap between music and image in our research. The relevance of music and image are measured by a ranking function derived from Okapi BM25. Music-image semantic matrix is constructed based-on textual information of music and image. PLSA (Probabilistic Latent Semantic Analysis) is applied on it to measure HSF (hidden semantic feature) of music and image. Neural Network is used to train a mapping function from music audio feature to HSF. In the phase of image retrieval, the music-image retrieval is based on HSF and textual feature. Finally, user relevance feedback is used for image reranking (short-term learning) and updating the music-image descriptive-word map (long-term learning) to enhance the retrieval results. To evaluate the image retrieval system, 4000 images with textual information (metadata) are collected from Flickr, 1836 songs are collected and textual information (metadata) of these songs are collected from AMG(All Music Guide). The results show that this image retrieval system can achieve good performance.

2. Chung-li Lu and Shyh-Kang Jeng, "AUTOMATIC GENERATION OF ACCOMPANIMENT FOR A JAZZ PIANIST"
In this article we try to generate interactive accompaniment from the trained model for a Jazz pianist. The solo and accompaniment corpus we process is in MIDI format, which is pre-generated by a human pianist, so that it is easy to extract the pitch and duration information of the solo sequence and the accompaniment events. Neural network is then applied, and let the computer find the feature with the training corpus. It seems to have quite good performance under evaluation of jazz experts.

3. Yen-Ting Chen and Shih-Heng Pan, "iComper AN INTERACTIVE DRUMMERUSING HMM-BASED MUSICAL SIGN DETECTOR"
iComper (interactive Comper) is an interactive Jazz accompaniment system which understands various soloist's intention when he or she improvises. In this thesis, we propose an HMM-based musical sign detector to bridge accompanist's realization when listening to music and intention given by the improviser. We apply music theory to our feature extractors on improviser's melody and map features to observations. The detector gives the highest-probability state using the observation sequence from the start of a tune to the current measure. A re-drum algorithm is proposed to combine the chosen percussion patterns and the volume pattern to generate accompaniment.

4. Zhi-Yan Lin and Shyh-Kang Jeng , "IMPLEMENTATION OF A VIRTUAL DJ SYSTEM ON EMBEDDED SYSTEM"
In this paper, the "Virtual Mobile DJ" system is implemented on an embedded system. During construction, we explored on Linux sound system, the UDA1341 codec, OSS (Open Sound System) driver on an embedded system environment, and on how to control MP3 format data on an embedded system without hardware support. Then a proper and clear user interface made by Qt GUI framework is proposed. Finally, a user could manipulate the "Virtual Mobile DJ" system by

touching the interactive touch-screen GUI functionality in embedded system platform.

10/19 11:00–12:00 論文發表三：音樂資料處理　　主持人：沈錳坤
Session III: Music Data Processing　　Chair: Man-Kwan Shan

1. 吳宜蓁，〈電聲音樂創作技法探討〉
近年來，電腦音樂的創作與其研究已逐漸地被重視，許多關於電腦音樂相關的學術文獻資料亦大量的增加，音樂的創作與演奏已逐漸地與電腦相互結合，也因為如此，它帶給我們音樂創作者的，是一個新的契機與新的挑戰。本論文分為兩部份：一為電聲音樂作品，二為有關作品創作理念及其體現方式之探討，並且同時包含電子聲音之創作技法與音色合成技術之敘述。論文第一章主要介紹電腦音樂的歷史背景與本論文之寫作動機與研究目的，第二章則探討美學概念在電腦音樂創作上之應用，第三章主要討論電聲音樂創作之技巧及電腦軟體的運用及操作，第四章則屬於作品的呈現及樂曲解析，第五章為結論。此論文之內容將論述電聲音樂的創作技法、作曲之理念與美學，以聲波合成技術與電腦軟體之運用作為音樂創作之示範過程與實例，以期體現電子音樂創作之美學價值。

2. 黃志方、周宜瑩、王鶴雄、李宏儒，〈自動化數字簡譜產生系統研究〉
This research, "Automated Numbered Musical Notation Generation System", is based on the numbered musical notation to develop the system with Arabic numerals and musical expressions using the standard MIDI as the main notation conversion format. The "Numbered Musical Notation Generation System" can be applied to any music software or music information notation, with the automated music composition techniques integrated, via the internet and the web platform to realize the window-based automated human-machine interactive composition and the Java Applet web page implementation. The research is hopefully to contribute the come out to the widely existing numbered musical notation system with a complete software and platform, which can be used for the popular music, Chinese music, and some other non five-line notation system conveniently, and even for the music promotion of education with great efficiency.

3. 廖琳妮，〈天倪在電子混合音樂中的音樂思想和語言〉
趙菁文(1973)，現為國立台灣師範大學音樂系專任作曲副教授。畢業於國立台灣師範學，師事陳茂萱 (1936-)教授。之後於美國史丹佛大學 (Stanford University) 取得博士學位，師事 Jonathan Harvey (1939-)，Brian Ferneyhough (1943-) 和 Chris Chafe (1952-)。在創作與演出經歷 1 中，趙菁文的作品成為台灣現代音樂界中極少數經常被演出的作曲家。自 2006 至 2009 六月展演記錄 2 中能夠發現，在共十六首原創作品或為新編制所改寫的作品中，三年間國內外演出共六十六場，超越一般國內外聽眾對現代作品 « 作品的首演意味封藏 » 的一般認知。趙菁文展現其積極活潑的創作力，並堪稱今天台灣樂壇上少數橫跨器樂與電子音樂的女性作曲家。因此理解趙菁文在創作上的理念與手法，音樂語言與思想，並以其獨特的音樂風格看台灣現代音樂的發展和教育。

10/19 14:30–15:50 論文發表四：音樂資料檢索　　主持人：古鴻炎
Session IV: Music Information Retrieval　　Chair: Hung-Yan Gu

1. 林子翔、陳韋臣、廖怡欽，〈快速分群式音樂檢索方法〉
本論文提出一個快速分群式音樂檢索方法來改善哼唱式音樂檢索系統的音樂比對速度。作法是先依聲音向量的相似度產生聲音向量群組中心點，再利用這些群組中心點將每首音樂的聲音訊號轉換成群組編號數列儲存於資料庫中。檢索音樂時，先將使用者哼唱的旋律轉成群組編號數列，再與資料庫中每首音樂的群組編號數列做比對，找出相似的音樂清單。實驗結果顯示，所提方法確實可有效縮短音樂比對時間，並擁有跟現有方法相當的準確度。

2. 謝雲凱、傅俊傑、鄭泗東，〈音樂情緒分類辨識與音色語句表示法研究〉
自古以來，音樂與人類的生活有著密不可分的關係，人類於滿足了基本的食衣住行後，便會追求其他物質層面的發展。當人們發現簡單且無意義的哼唱會產生不同的音高，即發現了音樂的存在，自從有了音樂後、舉凡人類的各種活動如祭祀、酬神、婚喪、慶祝、工作、交友、求偶等，都不難發現音樂的影子存在。畢達哥拉斯於某次在鄉下的一間小鐵鋪、發現了不同比例的鐵鎚敲擊的聲音皆不同，利用此純律製造出簡單的樂器的雛形，在爾後更發明了各種不同的樂器。而於各種樂器所集結演奏出來的音樂，又各自包含了許多各種不同的表現方式。從古至今的各種音樂型態，會由於樂曲編排、樂器編制、樂手風格、及地區表現手法等，產生出許多不同的音樂情緒。如古典樂中使用大調的曲子往往會給人快樂、明朗的感覺，小調的曲子相反會帶給人哀傷、憂愁之感。但以現今各類型音樂來說，此大小調分類的方式並不完全適用。所以希望能研究建構出一套有效的演算法、以電腦進行音樂，口語，聲音之情緒或感覺的自動辨識與多維尺度圖像化分類，並以日常生活語句作為各種特徵音色之表示。

3. 柯舒方、沈錳坤，〈音樂風格自動改編系統〉
隨著電腦科技的發展，人類對音樂的需求越來越大，音樂不再是只有純粹的聆聽欣賞，若能自己改編喜歡的音樂，會更加有趣。本研究的目的是開發一個「音樂風格自動改編系統」。系統讓使用者輸入一首 MIDI 音樂後，會依使用者選定的風格來改編主旋律。本系統將利用資料探勘重複序列探勘技術，找出音樂動機。接著依風格種類，採用不同的變奏方式來改變音樂動機，以產生不同風格的變奏曲。

4. 傅俊傑、鄭泗東，〈基於頻譜質心變化之演算法的音樂訊號節奏速度萃取研究〉
由於現今的編碼技術的發達，使得音樂訊號易於記錄與儲存。然而越來越大的音訊資料庫，卻讓使用者管理的困難度增加。音訊辨識或分割與分類需要有更多更精細的方式，如何更有效率的管理音訊檔案，此為現今音樂資料檢索（Music Information Retrieval）的主要研究方向。對於音樂的辨識與分類，最直接的相關指標就是聽者的聆聽感受，如：旋律，節奏，音色，更甚至是情緒。由電腦計算模擬並且預測聽者感受，並利用其結果做出相關的應用。本篇文章將探討音訊節奏資訊的萃取與標記，以頻譜質心的變化做為參考端點並進行節奏萃取，並以 698 首音訊資料進行計算測試，由結果可顯示本演算法可達到 81.95%的音訊節奏速度之辨識率。

【音樂會節目表一】

台灣電聲音樂會第一場 18 (Sun) 19:30

地點：國立藝術教育館（南海劇場 ）

1.	鄭建文 Chien-Wen Cheng	*飛蛾與火 Moth and Fire* Real-Time Interactive Music for Flute and Max/MSP 長笛： 林蕙蕙 Max/MSP 電腦操控：鄭建文	長笛與 Max/MSP 互動系統	10'00
2.	曾毓忠 Yu-Chung Tseng	*Piano-Forte* 環繞音響操控：曾毓忠	純電聲、四聲道環繞音響	8'30
3.	曾興魁 Shing-Kwei Tzeng	*為吉他與 Max/MSP 電子音樂作品* *Ambush from all Side* 吉他：黃修禮 Max/MSP 電腦操控： 曾興魁	四聲道環繞音響	8'30
4.	董昭民 Chao-Ming Tung	*"天鉤 "* 雙簧管：謝宛蓁 薩克斯風管：蔡佳修 單簧管：林慶俊	為中音薩克斯風、雙簧管、低音單簧管及雙聲道預錄電聲	9'30
		中場休息 Intermission		
5.	嶋津武仁 Takehito Shimazu	*石頭的呼吸 **Stone Breath*** for live computer 電腦即興演奏：嶋津武仁	Computer music	9'00
6.	林桂如 Kuei-Ju Lin & Christ Cobilis	*城市洞穴 Urban Cave*	An Interactive Improvisation	6'00
7.	Robert Wechsler (Palindrome Dance Group)	*七段回憶* *"7 Memory"* 舞者 Dancer: Robert Wechsle r	Dancer with Computer Music	10'00

※主辦單位保留演出曲目異動之權利 The organizer reserves the right to change the program.

【音樂會節目表二】

台灣電聲音樂會第二場 10/19 (Mon) 19:30

地點：國立藝術教育館（南海藝廊）

1.	趙菁文 Ching-Wen Chao	*光・聲境* *Light of Sound, Sound of Light* 大提琴：歐陽伶宜 Max/MSP 電腦操控：趙菁文	為大提琴 即時互動電子音樂 （八聲道 環繞） 互動影像	10'00
2.	黃志方 Chih-Fang	*竹* *Bamboo* 五弦電子小提琴獨奏 與 Max/MSP 控制：黃志方	5-String E. Violin & Max/MSP	9'30
3.	葛瑞莫 Bruce Gremo	*絨毛 Armonia* *Cilia: Armonia*	自製電子吹奏調控器 即興演奏	12'00
		中場休息 Intermission		
4.	曾興魁 Shing-Kwei Tzeng	*意難忘 "Unforgetable* *" Capriccio for Piano in 4 Hands* 鋼琴：何宛茹、何宜儒 編舞：Robert Wechsler 表演電腦操控：曾興魁	鋼琴四手聯彈 與電腦音樂作品	9'00
5.	吳疊 Dye Wu	*聲動之外* *Without Rhyme-Sounds* 擊樂奏：黃雅綾、戴健宇、吳亞璇、簡妤安 Max/MSP 電腦操控：吳疊	為平劇鑼鼓 與 Max 即時互動 預置電腦音樂	8'40
6.	傑弗利・史托瑞 Jeffrey Stolet	*用一隻手指完成的藝術 Things I do with my finger* *Interactive Performance:* : Jeffrey Stolet	Interactive Computer Music	12'30

※主辦單位保留演出曲目異動之權利 The organizer reserves the right to change the program.

【音樂會節目表三】

台灣電聲音樂會第三場 (演講音樂會)

時間：民國九十八年十月二十日(二)

晚間 7:00 演講、 音樂會

地點：國立台南大學 雅音樓音樂廳

1.	林幼雄 Yu-Hsiung Lin	*「風鈴與落山風傳奇」*	以電腦及管絃樂團比較演出 (DVD)	4'43
2.	黃志方 Chih-Fang Huang	*台灣三景* *Three Taiwanese Landscapes*	碎形影像與電腦音樂	5'45
3.	Robert Wechsler (Palindrome Dance Group)	*七段回憶* *"7 Memory"*	Dancer with Computer Music	10'
4.	葛瑞莫 Bruce Gremo	*絨毛: Armonia* *Cilia : Armonia*	自製電子吹奏調控器即興演奏	12'00
		中場休息 Intermission		
5.	落晃子 Akiko Ochi	*RAKASU 計劃* 電腦即興演奏：落晃子	Computer music	7'00
6.	曾興魁 Shing-Kwei Tzeng	*意難忘 "Unforgetable"* *" Capriccio for Piano in 4 Hands* 鋼琴：何宛茹、何宜儒 編舞：Robert Wechsler 表演電腦操控：曾興魁	鋼琴四手聯彈與電腦音樂作品	9'00
7.	傑弗利・史托瑞 Jeffrey Stolet	*用一隻手指完成的藝術* *Things I do with my finger* *Interactive Performance:* : Jeffrey Stolet	Interactive Computer Music	12'30

二 、演講者：傑弗利・史托瑞(Jeffry Stolet)、 Bruce Gremo、黃志方、Robert Wechsler、曾興魁等教授

主持人：李德淋院長

※主辦單位保留演出曲目異動之權利 The organizer reserves the right to change the program.

【樂曲暨作曲者簡介】

台灣電聲音樂會三場 10/18-10/20

地點：國立藝術教育館（10/18-19 南海藝廊）
國立台南大學 (10/20 雅音樓音樂廳)

1. 飛蛾與火 *Moth and Fire* **鄭建文 Vivian S. C. Hsiao**

曲名：飛蛾與火（為長笛與 Max/MSP 電腦即時互動音樂系統）
長度：10 分鐘
創作年份：2007-2009

《飛蛾與火》這首作品主要靈感來自飛蛾撲火的典故：「過去有佛，欲令眾生厭舍五欲，而說偈言：譬如飛蛾見火光，以愛火故而競入，不知焰炷燒然（燃）力，委命火中甘自焚」(《心地觀經·離世間品第六》)。 有感於生命的無奈乃在於無論你用何種方式去過，也都將走向結束，只是不同人選擇不同的方式去經歷它而已。 此曲乃藉由音樂呈現不願庸碌無為者，寧葬身火中也要擁有瞬間粲然的勇氣與此中無奈。長笛主要用來象徵飛蛾翩然，電腦部分則代表火焰灼灼，藉由互動科技將器樂與電腦即時數位效果器兩者緊密結合。 其中使用的主要 DSP 技術包括快速傅立葉轉換（FFT）產生的踏板效果及頻譜延遲技術、結合粒子化合成之延遲效果、反相延遲技術，並由電腦偵測現場器樂演奏的各種姿態數據來控制上述效果器的各類參數。藉由不同起落的即時效果器，搭配預先錄製、變形處理過的相似音色，疊合出各種絢麗繽紛的音色與織度，飛蛾在化為灰燼前來往穿梭於熾熱火焰間的景象，乃歷歷呈現。

Title: *Moth and Fire*

Format: Real-Time Interactive Music for Flute and Max/MSP
Duration: ca. 10 min.

This piece is inspired by the irony and sadness in the relationship between moth and fire - a moth tends to be attracted by the flame of fire in the darkness and eventually falls into the blaze. In this piece, the flute is intended to symbolize the moth and the computer the flame. The interactivity between the two are achieved by various real-time effects mainly including FFT freezer, spectral delay, granular delay, and reverse delay controlled by different algorithm based on the audio analysis of the flute performance. Different real-time effects and processed sound files of the flute are layered in various combinations to represent the image of the moth going in and out of the fire before its inevitable death in the fire.

鄭建文為北德州大學作曲博士、交通大學音樂研究所理論作曲組碩士。曾師事楊聰賢教授、及 Andrew May、Joseph Butch Rovan、Cindy McTee、Phil Winsor 等教授。曾任北德州大學 CEMI 實驗音樂與跨媒體中心助教（TA）、北德州大學作曲系講師（TF），並曾任教交通大學、屏東教育大學、東海大學、嘉義大學等音樂系所，現任台北藝術大學、台灣藝術大學、高雄師範大學、台中教育大學音樂系（所）兼任助理教授。

其器樂曲獲獎諸如：2007 年達拉斯交響樂團之 VOC 青年作曲比賽首獎、2006 年教育部文藝創作獎優選第二名、2005 年「第三屆青年打擊樂作曲比賽」佳作、2003 年教育部文藝創作獎佳作、2000 年獲新竹縣文化局「第四屆客家新曲獎」徵曲比賽「藝術歌曲組」佳作。其電腦音樂創作獲獎諸如：2008 年國際電腦音樂學會（ICMC）區域作曲獎、全國學生創意作品線上競賽優選獎（2007）、特優獎（2006、2005）、第六屆國際短篇電子音樂創作比賽決選作品（西班牙）、Bourge 國際電子音樂作曲比賽決選作品 (2009)。 其作品曾受邀、獲選演出於德國 MusikTriennale Köln 音樂節、美國電子音樂學會年會（SEAMUS）、國際電腦音樂學會年會（ICMC）、古巴國際電子音樂節 (Primavera en La Habana)、Sante Fe 國際電子音樂節、美國 Spark 電子藝術與音樂節、 法國 Bourges 國際電腦音樂節 Synthese、北京國際電子音樂節等，其電子音樂作品並被收錄於 ICMC、Computer Music Journal 及 SEAMUS 所發行之 CD 與 DVD 中。

Chien-Wen Cheng received his Doctor of Music Arts from the University of North Texas (2007), and Master of Music from the Natioanl Chau-Tung University (2001). Currently he works as adjunct assistant professor in National Chau-Tung University, National Ping-Tung University, and Tung-Hai University.

He has won numerous awards for his acoustic music including: first prize in the "2007 Dallas Symphony Orchestra / Voices of Change Young Composers Competition" (USA); second prize in the "2006 Fine Arts Creation Award" (Taiwan); finalist in the "2006 Chang-huei Syu International Composition Competition" (Taiwan); mention award in "The 3rd Percussion Music Composing Competition" (2005, Taiwan); selected work in "2004 Taiwanese Young Composers' Masterpieces" call-for-scores competition; mention award in "2003 Fine Arts Creation Award" (Taiwan); selected work in the 2002 orchestral call-for-scores competition in "Tune in to Taiwan – Taiwan Composers Series"; mention award in the "2000 Hakka Vocal Music Composition Contest" (Taiwan). His electroacoustic pieces won the first prize in both 2005 and 2006 National On-line Arts Creativity Competition in Taiwan, and were among the finalists in Bourge International Composition Competition (2009) and the 6th Electroacousitc Minatures International Contest (Spain). He also received Regional Composition Award from ICMC 2008. His electroacoustic works are included in SEAMUS, ICMC and Computer Music Journal CD and DVD releases. His electroacoustic pieces have also been recognized through performances at music festivals and conferences including: Bourges Synthèse Festival in France (2006); SEAMUS National Conference (2005, 2006, 2007); the International Computer Music Conference (2005, 2006, 2008); the Bellingham Electronic Arts Festival in Washington (2005); the Santa Fe International Festival of Electroacoustic Music in New Mexico (2004, 2006); the Spark Festival in Minnesota (2006); the "Primavera en La Habana" International Electro-acoustic Music Festival in Cuba (2004, 2006); the Most Significant Bytes Multimedia Concert in Ohio (2004); the LaTex Electronic Festival in Texas (2004, 2005); New Music/New Media Concert in Oklahoma (2005).

2. *鋼琴變奏曲 Piano Forte* 曾毓忠 Yu-Chung Tseng

此作品唯一之素材來源為鋼琴。透過一種近似作曲家貝多芬與布拉姆斯常應用之所謂”發展變奏”(developing variation)手法，探索鋼琴聲音內在張力、音色或頻譜型態、以及聲響姿態形變與幻化之最大可能性。

許多處理過之鋼琴聲音片段，以一種數碼微蒙太奇混音(Digital Micro-Montage Mixage, H. Vaggione)之手法，在聲音之極精微層次上(Micro-level, E. Miranda)將素材加以組織與編排，建構與創作一首具耳朵劇場(Theatre of Ears, F. Dhomonte)效果與藝術趣味之幻聽作品(Acousmatic work)。此作品開創與完成於 2008 年 9 月至 10 月中旬間於台北教育大學電腦音樂研究室，2008 年首演於北京國際電子音樂節，2009 年 10 月邀演於上海國際電子音樂周。

The title comes from the single sound source of the piece-Piano,which characterizes the work. The idea of limiting sound source and samples being recorded in small fragments is to work closely to sound, to investigate the tension of sound, to explore the possible transformation of sound, and to develop unique timbres and gestures.

The source recordings were manipulated and transformed by using several software including Csound, SoundHack, Metasynth, Audiomulch and Audition …etc. The processed sounds were then organized(E. Varèse) in a manner of micro-montage mixage(H. Vaggione) to create an artistic interest work.

The work was created and finished at the Computer Music Studio at National Taipei University of Education between September and Mid-October in 2008.

曾毓忠 1998 年獲得美國北德大學(UNT)音樂藝術博士學位(DMA)。現為交通大學音樂研究所專任副教授、台北教育大學音樂學系、東吳大學音樂研究所兼任。曾擔任台灣電腦音樂學秘書長，現擔任該學會理事。同時也是國際電腦音樂協會(ICMA)之會員。

電腦音樂曾獲義大利 Pierre Schaeffer 國際電腦音樂創作比賽 2004 首獎與 2008 參獎、捷克布拉格 MUSICA NOVA 國際電腦音樂創作比賽 2004、2005、2007 決選作品、比利時 Metamorphoses 國際雙年電腦音樂比賽 2006 與 2008「專業組」優勝作品、義大利烏定市國際當代音樂創作比賽 2004 評審團推薦作品與 2006 優勝作品、法國 Bourges 國際電腦音樂創作 1998、1999、2005 決選作品、巴西聖保羅 CIMESP 雙年國際電腦音樂比賽 2003 入選作品，以及美國北德州立大學電腦音樂創作比賽 1997 二獎。

電腦音樂作品入選或邀約發表於北京 Musicacoustica 2005、2006、2007、2008，上海 Eelctroacoustic Music Week，加拿大 EuCuE2000、2004、2009，首爾 SICMF2002、2003、2004、2008，ICMC98、1999、2001、2003、2004、2006、2008、2009 等之國際電腦音樂節。作品收錄於加拿大 DISCONTACT-III，美國 CDCM 電腦音樂專輯第 27 集，義大利 Pierre Schaeffer2004 與 2008 優勝作品專輯，丹麥 KECD2、SEAMUS 二十週年專輯，比利時 Metamorphoses 2006 與 2008 優勝作品專輯，捷克 MUSICA NOVA 2004、2005、2007 優勝作品專輯，義大利烏定市 Contemporanea 國際當代音樂創作比賽 2006 優勝作品專輯。

Yu-Chung Tseng is a full-time associate professor of music at National Chiao Tung University. His music, written for both acoustic and electronic media, has been recognized with several international composition competitions including Italy-Pierre Schaeffer(1st Prize/ 2004,3rd Prize/2008), Italy-Città di Udine (Mention / 2003,finalist/2006), Czekh- MUSICA NOVA (finalist/ 2004,2005,2007), Belgium- Metamorphoses (Finalist/2006,2008), France-Bourges (finalist/1998,1999,2005)。

Mr. Tseng's works have also received many performances at festivals and conferences from organizations including China-Beijing Musicacoustic (2005,2006,2007,2008), Shanghai 2009 Eelctroacoustic Music Week,Korea-Seoul SICMF(2002,2003,2004,2008),ICMA-ICMC (98, 99, 2001, 2003,2004,2006,2008, 2009), U.S.A.-SEAMUS(97,98).His music can be heard on labels including CDCM vol.28(USA), Discontact iii (Canada), Pescara2004 and 2008(Italy), Contemporanea 2006(Italy.),Metamorphoses 2006 and 2008(Belgium), MUSICA NOVA 2004,2005,2007 (Czekh) and SEAMUS 25th Anniversary CD(USA).

3. 為吉他與 Max/MSP 電子音樂作品

曾興魁 Shing-Kwei Tzeng

十面埋伏 Ambush from all side 為六弦吉他及預錄繞場音響

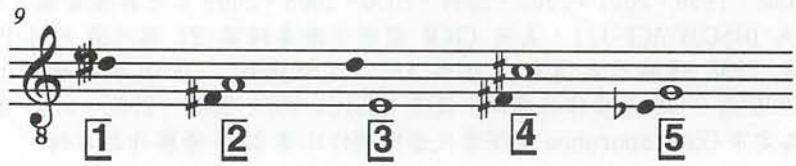
故事源於大家耳熟能詳的楚漢相爭的史實，這是為各種不同的吉他(如五弦

的波利維亞 Charango, 十弦的西班牙吉他等)與預錄音響的一組作品，第一首作品為最常見的六弦古典吉他，至於音響的部份，設計為環繞音場四聲軌演出。

這一首作品定弦與傳統不同，以 D 基礎音——古曲「十面埋伏」的調性，其自然泛音定弦(第 9 泛音為最高音的第 1 弦，第 3(或 6)泛音為第 2 弦，第 5(或 10)泛音為第 3 弦，第 7(或 14)泛音為第 4 弦，第 11 泛音為第 5 弦，基礎音 D 為最低音的第 6 弦)：

曲式為大三段式，第一大段為 aba 形式； 第二大段為吉他傳統的語法：旋律配上三連音； 第三大段為分解和弦的伴奏，當做預置音響主奏的背景。素材用「十面埋伏」局部的動機，和聲沿用個人一系列的和聲材料。聲軌部份的素材，大部份取自琵琶古曲的片段的變化編輯而成 。謹以本曲為馬水龍教授七十歲生日祝壽。

第二首為五絃吉他 Charango 作品「勇士歌」，取材於屏東霧台鄉宿凱族民歌「勇士歌」的旋律，也是獻給八八水災的四位佳暮芙雄。其定弦如下：



聲軌部份取材於魯凱族的唸謠與民歌的變化與剪輯。

今晚的演出，由於時間的制，只演出第一首十面埋伏。

Ambush from all sides

The story origins from the fight for hegemony between Hahn and Zhur state. This is the first piece of a suite for different guitars and electro-acoustic sounds. It uses the classical 6 string guitar, the 5 string Bolivia Charango and the 10 string Spanish guitar.

The electro-acoustic sounds can be Surround 5.1 channel or 4 channel (or the piece could be played without any as a solo guitar piece).

The scordatura is: (refer above the Chinese version)

The musical form is like a complex ternary, the first part is a simple “a b a” form, the second part is a traditional guitar syntax, e.g. melody with a triplet accompaniment, and the last part is an arpeggio pattern, as a background to the electro-acoustic sounds.

The materials are extracted from the original motives of the Chinese Pi-Pa masterpiece "Ambush from all sides", and the harmony is extended using my serial harmony. This piece is a 70th birthday gift for Professor Ma, Shue-long.

The seconde piece is composed for 5 strings Charango " An ode for 4 Warriors " , during the flood disaster in Chia-Mu, Wu-Tai of Ping Tung County.the 4 warriors has salved their clan people in emergency..
the secodatura shows as: (refer above the Chinese version)

The piece is dedicated for the 4 Warriors in Gia-Mu.

1968-1972 年就讀於國立台灣師範大學音樂系，自 1977 年獲教育部公費留學德國芙萊堡音樂院 (Musik Hochschule im Freiburg/Germany)，師事 K. Huber , B.Ferneyhough 教授，1981 年獲藝術家文憑 (Pruefung der Kuenstlerische Reife)並返國任教國立台灣師範大學音樂系暨音樂研究所。1986/87 年獲法國政府獎學金於法國現代音樂暨音響研究中心(IRCAM)研究，同年並獲得巴黎師範音樂院(Ecole Normale de Musique de Paris)電影作曲文憑。

作品曾在荷蘭高地雅慕斯音樂節 (Gaudeamus Music Week,1981/84 ASKO Ensemble) 阿克瑪音樂節 (Alkmaar Music Festival1990)漢城亞太音樂節(Asia Pacific Music Festival1990) 日本仙台亞太音樂節，美國、德國、法國 (Presents 1996 2E2M) 等地演出。1987 年曾於巴黎「國際藝術家館」(Cite des Arts)、1998 年於羅馬舉行舉行個人樂展。2002 年三月於新竹市立演藝廳、屏東文化局中正藝術館舉行個人合唱作品音樂會，2004 年九月在新竹演藝廳舉行紀念九二一大地震五週年合唱作品音樂會，2005 年四月在國家音樂廳「詩經的清明」音樂會中發表管弦樂作品「詩經蓼莪」，2006 年接受國家交響樂團託完成為管弦樂與四聲軌電子音樂的作品「生命之歌」，於 2007 年五月由旅美指揮家陳美安指揮國家交響樂團在國家音廳舉行首演，2008 年 12 月於台北國家音樂廳演奏廳及新竹市立演藝廳舉辦個人樂展「音樂新界面」。。2002~3 年美國傅爾布萊特訪問學者(Fulbright Schoolship)，美國史坦佛大學訪問學者，美國北德州大學訪問學者、客席作曲家。1999~2002 年及 2005~2007 年榮膺三屆中華民國電腦音樂學會理事長。2005 年自國立台灣師範大學退休，獲聘任教開南大學資訊傳播學系教授。 2007 年十月應邀在 Copenhagen – Malmoe Festival 發表作品" 超級衝突"及在瑞典 Malmoe 音樂院演講，2008 年六月「綠島小夜曲綺想 」發表於法國電台梅湘廳 (Salle Messiaen, Radio France)。

曾榮獲法國 Ville D'Avray 作曲比賽首獎(1984)，第三屆國際管風琴作曲比賽第一大獎(1986)。

1968-1972 studied at Music Department of National Taiwan Normal University, graduated with B.A.
1977-1981 got scholarship of Education Ministry Taiwan. Studied at Musik Hochschule im Freiburg. Major in composition with Prof. Klaus Huber and Prof. Brian Ferneyhough; theory with Prof. Peter Foertig. Minor in piano with Prof.

Edith Picht-Axenfeld and Prof. Wolfgang Watzinger.
1981 graduated with " Pruefung der Kuenstlerlischen Reifer" at Musik Hochschule im Freiburg/Germany.
1980 participated Darmstadt Sommer Ferien Kurs.
1981~2005 as Professor at Music Department of National Taiwan Normal University, Taipei/Taiwan. Teach in composition (individual instruction), form and composition, computer music, music analysis etc.

1986-1987 got scholarship of French Government, studied film music at Ecole Normal de Musique de Paris/France. Graduated with Diplom.

1987 Research at IRCAM/ Paris France (Institut Recherch Coordination Acoustique et Musique Contemporaire)
1990 co-founder of ISCM-Taipei Section (International Society for Contemporary Music).

1999 established Society of Electronic and Acoustic Music, Taiwan and was selected as Ist Chairman, 2005~2007as the 3rd Chairman.
Fulbright Scholar 2002~03, visiting scholar CCRMA, Stanford University (2002~03) Visiting Scholar, Guest composer of College of Music, University of North Texas. Since 2005 retired from National Taiwan Normal University and is retained at Department of Information Communications by Kai-Nan University.

His compositions were performed by Gaudeamus Music Week, 1981/84 by ASKO Ensemble, World Music Days and Festival of ISCM Hong Kong 1988, Alkmaar Music Festival 1990(Netherlands), Asia Pacific Festival Sentai/Japen1988 Seoul/Korea 1990, Presence Festival Paris/France 1996 by Ensemble 2E2M/ France, Keelong/Taiwan New music Festival 1997 by Ensemble 2E2MQuartet Alea III Boston /USA 1995, National Concert Hall by National Symphony Orchestra Taiwan 2007, he was the Chairman of SEAM (Society of Electro Acoustic Music Taiwan)

He has won :
Le Premiere Grand Prix de 3eme Concour International Composition pour Orque 1986 ST. Remy/France. **第三屆國際管風琴作曲比賽首獎**
Le Premiere Prix de Ville D'Avry International Library for Contemporary Music 1984 Paris/ France **法國現代音樂圖書館作曲比賽首獎**

4. "天鉤 " Cetus **董昭民 Chao-Min Tung**

為中音薩克斯風、雙簧管、低音單簧管及雙聲道預錄電聲
天鉤為中國星座名，在西方為構成五角形天仙座中最亮的一顆星。
此曲從五角形的概念出發，分別以三支管樂加上左右聲道電聲象徵五角形的點，並以希臘的王族星座神話故事中的五個角色附予各點不同的音樂特性和關係，詮釋聲響、時間、空間與人的關係。

神志載：二十八宿，天元氣，萬物之精也。東方角有一宿曰“尾”。其型彎且銳利，懸于天際，故眾稱之為天鉤也。
中國傳統星宿神話中的”天鉤“和希臘王族星座神話故事中的鯨魚座在戲劇上有異曲同工之妙，而這次受交大室內集樂委托所創作的“天鉤”，也呼應了音樂會的標題“多魚的音樂時空“！
莊周夢蝶，我幻游如魚…

台灣作曲家董昭民於一九六九年出生於臺北。作曲師事錢南章教授，德國Johannes Fritsch，Mauricio Kagel 及 Nicolaus A. Huber。一九九九年夏天獲最高藝術家文憑並以該校最優異成積畢業。同年獲頒德國科隆市政府作曲獎及獎學金。二〇〇一年獲台灣國家文藝基金會的作曲贊助，二〇〇四年獲德國柏林Villa Aurora 藝術家獎學金，二〇〇六年獲許常惠音樂創作獎民族器樂類第二名，二〇〇八教育部文藝創作獎教師組音樂作曲類特優，同年並獲國藝會補助，發行他個人第一張創作作品集“音之旅”。
董昭民的作品已在亞洲，美洲及歐洲的音樂節先後發表演出：二〇〇〇年台北國家音樂廳樂壇新秀，二〇〇二年及二〇〇四年柏林三月音樂節〈*MaerzMusik Berlin*〉，二〇〇四年美國芝加哥新音樂節〈*Soundfield Festival Chicago*〉英國哈德斯費爾特音樂節(*Huddersfield Contemporary Music Festival*)，二〇〇五 慕尼黑新音樂系列〈*musica viva München*〉等。與他合作的知名團體及藝術家包刮臺灣采風樂坊，德國摩登樂團〈*Ensemble Modern Frankfurt*〉，維也納音響論坊〈*Klangforum Wien*〉等。
董昭民的音樂創作，函蓋了中西樂器的獨奏，室內樂，交響樂，輕歌劇，戲劇音樂。他多次與畫家及舞蹈家合作創作舞蹈音樂及多媒體表演藝術，並融入電子音樂，發展他藝術表達的多樣性。2006－2007年擔任臺灣采風樂坊駐團作曲家，目前為新竹交通大學音樂研究所多媒體音樂創作組老師。

5. *石頭的呼吸*
Stone Breath

嶋津武仁 **Takehito Shimazu**

The computer music works is mainly inspired by the breath of the stone.

Takehito Shimazu was born in 1949, Japan. He studied composition with Prof. Sesshu Kai (in Tokyo), with Prof. Isang Yun (in Berlin) and others. He produced electronic and computer music at the electronic studio of the Technical University of Berlin (**TU-Studio Berlin**), at **IRCAM** in Paris, at **Les Ateliers UPIC**/Paris (now CCMIX, Center of Computer Music I.Xenakis) and INA-GRM in Paris/France. His activities as Composer (and as Conductor) spread widely from Japanese Traditional Dance, Modern dance, Multi-Media, Performing-Arts and Music for Solo, Ensemble, Chorus to Orchestra Music.
Participated at:
He took part in the concert series "**Stimmen**","**Inventionen**" in Berlin (1978-81)
The Summer Seminar for new music in Darmstadt/Germany (1980)
The International Experimental Music Festival in Bourge/France (1980,81)
The ACL Pan-pacific Asian Music Festival in Philippines (1991)
ISCM(International Society of Contemporary Music) in 82(Graz/Austria), in 88(Hong Kong) and in 93(Mexico-city), a commission work of **ISCM** in 90(Oslo).
ICMC (International Computer Music Conference) in 88 (Cologne) and in 93 (Tokyo), in 96 (Hong Kong).
Pan Music Fest.in Seoul/ Korea(1984,86)
" **Japan Today in Scandinavia** " in Stockholm/Sweden(1990)
Saarbrucken Music-Fest. in Saarbrucken/Germany (02),
Dresden Music-Fest. In Dresden/Germany (05),
Chamber Music festival in Wroclaw/ Poland (06) ,
And any other festivals in Asia and Europe.

6. *郊區洞穴 Urban Cave*

林桂如 **Kuei-Ju Lin & Christ Cobilis**

This piece needs a small mixer, stereo PA, and grand piano with computer to perform Urban Cave with interactive improvisation.

林桂如,- 作曲家，受完整學院音樂訓練，但作品型式開放且類型廣泛，除創作外，亦對音樂劇場等跨領域創作有極高熱忱，於大學時期起即積極參予劇場及影像的音樂設計與創作，已有超過十年的經歷，近年來更將創作媒介擴展至電腦音樂。林桂如希望能以聲音裝置作品來探討地理景觀與聲音、行為之間的關連。尤其對於研究蝙蝠的聲納系統有很強的興趣，希望透過了解蝙蝠的聲納系統，將研習結果轉化運用於多聲軌的音樂作品上。除了音樂創作的創意，這個想法還需藉助生物學及聲學多方面的研究配合。

Kueiju Lin a Taiwanese composer, sound artist and performer presents a piano improvisation set. As a composer and sound designer, she has participated in numerous interdisciplinary projects in Taiwan, including theatre, films and documentaries.

Currently, she is the music director of the **M.O.V.E.** Theatre Group, an experimental performing arts group based in Taipei.

7. *七段回憶* **Robert Wechsler**
7 Memories

In performing interactive pieces, a structure must be found which allows compositions to be partly fixed and partly flexible. In the beginning we found ways to start and stop samples and influence their pitch through performer gesture. More recently, realtime digital signal processing has allowed us subtler and more expressive alternatives.
Two questions stand out: What do you control, and how do you control it? In other words, what parameters of sound composition do you give to the performer, and what physical gesture or changes in the performer's body do you use to control those parameters? While these questions are paramount, there is little go by and the results are hard to predict. Most of the possibilities that come to mind fail to give an intuitive or expressive result. Some, however, work brilliantly.
I have had the pleasure to work with many composers and each one has dealt with the interactive question differently. "7 Memories" is a compilation of excerpts -- choreographic and acoustic memories. It includes samples and fragments of interactive work from interactive Dan Hosken, Pablo Palacio, Hannah Grönigen, Atau Tanaka, Steve T. Eudaly and others. I would like to thank all of these contributing artists (including those not mentioned by name) for their extraordinary cooperation and sense of exploration. After all, it is not every composer who is willing to let their music be controlled by the movements of a dancer!
The technology used in 7 Memories work is based on motion tracking. It uses a CCD video camera and PC computer. Software includes EyeCon (motion tracking), MAX/msp and SuperCollider. It is partly processed in realtime, and partly sampled.

Please refer to "Keynote Speaker" for the details of Robert Wechsler's bio.

光・聲境
8 **Light of Sound, Sound of Light** **趙菁文 Ching-Wen Chao**

在「光・聲鏡」中，人為的演奏、電子音樂的聲響、互動影像的光線，成就一個三重奏的角色關係。大提琴的演奏或是電子音樂，驅動出隨機的 3D 影像，時而建立視聽之間的平衡，時而又混淆此平衡性，造成視覺與聽覺上的錯位。
這一首作品的靈感很難說來自於任一個特定的事物，主要是當時的我期盼對於音樂的冒險，與創作上的期許突破，但的確有一部份是來自對於京都龍安寺枯山水庭園的回憶，其外在的七五三石，決定了樂曲中的一些主要結構，包含 15 個子段落、5 種情境、3 次循環（由 obsession 至 healing 的昇華歷程）、7 種影像互動、6 個焦點音高（音程間距為 5 堆石塊之數目）等…。而影像在這首作品中的角色，如同一面明鏡（龍安寺的白沙），映照出外在與內在，夢境至現實。
電子音樂中的聲響素材，完全源自於我的「第二號弦樂四重奏」，也是在美國求學期間的第一部作品，它的片段像是回憶一般，貫串整

首樂曲。樂曲的開端，呈現冥想般的無聲，伴隨著極為纖細的聲響晃動；它們像是來自另一個世界的聲音，無實體般，細緻、稍縱即逝的幻影。在此情境之中，大提琴經由互動 harmonizer，形成巨大的和聲，似乎試圖劃破這像是夢境中的言語。有別於之前的神秘與不確定性，而後的音樂行為轉至焦點 D 音上，由輕盈的泛音旋律，與神馳的舞蹈所主導，複音聲部的節奏與脈動，像回聲般反覆，交織形成一複雜節奏的織體。經由幾次昇華的歷程，總以巨大的聲響，在環場聲效中快速奔馳，席捲包圍著瘋狂上升、漸快的音符，最終停留在光影互現的境地，綿長的旋律自信地暢所欲言，在飛舞的聲境中吟咏。（本曲為 2008 年兩廳院獨奏家系列委託創作，其中電子音樂部分原為八聲道、總曲長 23 分鐘，今晚為四聲道，並以較短的版本呈現。）

I can hardly say where I have drawn my inspiration for "Light of Sound, Sound of Light." The piece is more like to summarize at that time what I have expected to build a turning point in composition, and what I have hoped to travel in music. However, memories from the Ryoanji in Kyoto have certainly been a great part of the composition's initial impetus. The 5-2-3-2-3 (or 5-7-3) number of rocks in each of the 5 sets in its garden determines some important structures to this piece, in terms of 3 cycles, 5 realms, 15 subsections, 7 patterns of visual presentation, and 6 focal pitches (defined by 5 intervals). The 3 cycles denote 3 times of resolution from different obsessions, which are characterized by 5 different sonic realms. So much research has already discussed in depth regarding the mystery of Ryoanji and its profound denotations, such as the golden ratio of the rocks, the white sand, the pure land, the awareness, the infinity, the Zen, etc., but I have only tried to draw what I feel close to this work.

The first cycle begins with fragments of a dream. It is like in nature, where sounds are not expected or planned to take place. These delicate, non-substantial, quiet and shadowy sounds, like air bubbles, emerge from silences. They volatilize so quickly, as if the silence itself is moving. Subsequently, the sounds are gradually being structured, while the instability is gradually resolved to pure tones (six focal pitches), which denote the origin, the oneness and the purity. This purity is subsequently disintegrated into some flying objects moving in circles and spatially surrounding the space. Everything is evanescent and changing, continuously changing.

The second cycle comprises a light overtone melody and a confident dance, which gradually evolves a quasi-complex polyphonic event. The cello and its real-time processed sounds shimmer through the repetitive rhythm and polyphonic body. The layers of sounds are gradually being stretched by the electronics and spatialized into big circles flying around the space, like a large vortex which consists of hysterical acceleration and vertical ascending. They finally vaporize themselves into a simple but passionate melody chain, which is accompanied with traces of early memories, like some illuminant objects in the mist.

The 3D visualization is real-time triggered by volume and pitch of the cello, and sometimes of the tape, which render random changes of size, color, speed and brightness of the light circles. The electronic sounds were purely drawn from one of my previous works, String Quartet No. 2, which was the first piece I accomplished while studying at Stanford University. They have gone through some DSP techniques, mostly granular synthesis and filters, and are spatialized in

real-time to give certain meanings to different sections.

The piece was commissioned by the Taiwan National Concert and Theatre Hall in 2008. It was a 23-minute piece and realized in 8 channels, but a shorter version in 4 channels for the concert tonight.

趙菁文於 2002 年獲美國史丹佛大學(Stanford University)音樂作曲博士學位，現任教於國立台灣師範大學音樂系。在美期間師事目前極具當代音樂影響力之作曲家 Jonathan Harvey 與 Brian Ferneyhough，以及史丹佛大學電子音樂中心所長 Chris Chafe、電子音樂先鋒 Jean Claude-Risset。曾獲亞洲作曲家聯盟青年作曲比賽第一獎、音樂台北作曲比賽第一獎、兩廳院 Fanfare 作曲比賽第一獎、教育部文藝獎、蔣經國學術文教基金會博士論文獎。近年作品展演之合作團體包括歐美著名之新音樂演奏團體 Arditti String Quartet、Ensemble On_line Vienna、Klangforum Wien、California EAR Unit、St. Lawrence String Quartet、VOXNOVA、EARPLAY、the Eighth Blackbird、the CALARTS ensemble 等，以及國內演出團體如台北市立交響樂團、國家交響樂團、國立台灣交響樂團等。作品展演於世界各地之新音樂活動，如德國達姆斯達城現代音樂節、德勒斯登音樂節、法國電子音樂學會 EMS 音樂節、法國 38eme Rugissant 音樂節、北京國際電子音樂節、上海國際電子音樂節、國際電腦音樂節 (ICMC)、GMEM Festival、Colon Electronico、韓國漢城國際電腦音樂節等。

Ching-Wen Chao is currently appointed Associate Professor in the Music Department, National Taiwan Normal University. She lectured at Stanford University in 2002-03. She received her DMA in composition at Stanford University, where she studied with Jonathan Harvey, Brian Ferneyhough, Chris Chafe and Jean Claude-Risset. She was also committed to her research and composition of electronic music at the Center for Computer Research in Music and Acoustics (CCRMA).

Her recent composition was discussed in Neue Zeitschrift für Musik published by Schott, and one of her recent performances was given in Salle Olivier-Messiaen at Radio France in June 2008. Recent awards include the First Prize of the Young Composers Competition of the Asian Composers League, and the First Prize of the Music Taipei Composition Competition, Arts Award in Taiwan, the First Prize of the Fanfare Composition Competition, and the fellowship recipient of the Chiang Ching-Kuo Founation Fellowship in Humanities. Her works have been premiered in music festivals including the 2008 Electroacoustic Music Society Conference, Institut fuer Neue Musik und Musikerziehung in Darmstadt, Dresdner Tage Fuer Zeitgenoessische Musik, Shanghai International Electroacoustic Music Festival, Beijing International Electroacoustic Music Festival, Festival des 38ème Rugissants, Festival of the GMEM, Colon Electronico Festival, Contemporary Clarinet Music Festival, Seoul International Computer Music Festival, International Computer Music Conference(ICMC), etc. She has collaborated with world-renowned new music ensembles such as the Arditti String Quartet, Klangforum Wien, Ensemble On_line Vienna, California EAR Unit, St. Lawrence String Quartet, the Eighth Blackbird, VOXNOVA, EARPLAY, Taipei Symphony Orchestra, National Symphony Orchestra, National Taiwan Symphony Orchestra, etc.

9 *竹 Bamboo* 黃志方 Chih-Fang Huang

「竹」電腦與電子五絃小提琴互動音樂作品創作於 2009 年 5 月，主要創作靈感源自於竹的蒼勁生命力，以及中國文人對於「竹」的一些文化意涵，包括堅毅與孤傲的精神與樸質無華的謙遜美德。本曲在技術上運用 Max/MSP 程式，透過一些 Delay Line 與濾波器的設計，以即時數位音訊處理得方式來達到所謂「互動音樂」的效果，彷彿使人置身於一片巍巍蕩蕩的竹林間。由於該曲也有一些較高層次上的演算法音樂處理，使得音樂上呈現所謂的「不定性」(Indeterminacy) 特質，一方面讓演奏者擁有即興的樂趣，另一方面亦使聽眾存有更大的遐想與思考的空間。本曲亦試圖透過電子五絃小提琴來運用部分二胡的特殊技法，在與現代科技整合的當下，亦希冀可與中國深厚的文化有所連結，更希望能透過比較抽象的音樂手法來表達傳統文化上的特色，使聆賞者感受到君子淡雅如水的意象。

The Interactive Music for Electric 5-String Violin and Computer "Bamboo" was composed in May of 2009. The main idea was inspired by the special vigorous and hardy living power of the bamboo, and the Chinese cultural characters including the spirit of persistency and humility. This piece uses Max/MSP programming with delay lines and filters, to implement the real time digital audio techniques, to perform the "Interactive Music", and make the audience feel as if they are in a huge bamboo tree forest. There are some meta-level algorithmic composition processes, to make the "indeterminacy" happen for both the performer with the joy of improvisation, and the audience with the space to think. Some Erhu (Chinese Violin) articulation is adopted for the electric 5-string violin, in order to connect with the Chinese cultural convention even under the integration with modern technology. Furthermore, the composer hopes the abstract musical language can be used to convey the cultural convention, to express a simple and elegant attitude toward life.

黃志方為國立交通大學機械研究所控制組博士，同時亦為國立交通大學音樂研究所作曲組碩士，主修作曲，師事吳丁連教授，電腦音樂方面則追隨 Prof. Phil Winsor 近十年之久。曾任國立交通大學音樂研究所、聲音與音樂創意科技碩士學位學程助理教授、中山科學研究院電子系統研究所副研究員。現任元智大學資傳系助理教授，暨台灣電腦音樂學會秘書長。專業為作曲與理論、電腦音樂創作、音樂科技研究、虛擬實境程式設計。除了電腦音樂研究與創作外，一些作品也在國內外獲獎與演出，包括台灣省交響樂團作曲比賽佳作與台灣藝術教育館之全國藝術創意作品線上競賽音樂創意類比賽特優等。又如 2004 年五月獲選參加 24 屆亞洲作曲家聯盟大會暨音樂節徵曲以色列作曲家聯盟大會演出，台灣參選作品「流浪者之歌」並親自擔任作曲、數位聲波處理與小提琴獨奏。又如：2004 年『澎湖鄉土音樂創作甄選暨作品發表』以所創作之三樂章鋼琴組曲「菊島風情」獲得首獎，親自擔任鋼琴獨奏演出。作品曾獲選受邀於國際音樂節 Spring Festival 2006, Havana, Cuba Electroacoustic Festival 演出，以及六月份美國 ICMC 國際電腦音樂會議作品 "Microcosmos" 演出。著作方面有 SCI 等國際期刊數篇，以藝術科技、自動控制與機電整合等相關跨領域研究為主。

Chih-Fang Huang, Assistant Professor at the Institute of Music at National Chiao Tung University, was born in Taipei city, Taiwan. He acquired both a PhD in

mechanical engineering and a master's degree in music composition in 2001 and 2003 respectively from National Chiao Tung University. He studied composition under Prof. Wu, Tin-Lien, and computer music under Prof. Phil Winsor. His electroacoustic pieces have been performed in Asia, Cuba, Columbia, and the USA, including International Computer Music Conference (ICMC) and other festivals. Some conference papers and SCI international journal papers are published with his music technology research filed, including the interdisciplinary research between art and technology, automatic control, and mechatronics.

10 ***絨毛 Cilia*** **Bruce Gremo**

Armonia, titles sometimes indicate a strategy by which a composer listens to sonic material. The pre-Socratic Greek word *armonia* was a shipbuilder's term meaning joint. 'Harmony' is a descendent of that term. The problem of harmony is the problem of the joint, of not only how to bring together, but how to secure together. It is my 'interest' in this structured improvisation using the Cilia. The Cilia is an electronic flute controller; in this regard, it is a first and unprecedented instrument. One of its design objectives was to enable improvisation with timbre. In this performance, the focus is on the threshold between harmonic timbre and density (the point at which simultaneities of notes (e.g., clusters) become more than a chord).

Bruce Gremo is the invited speaker of this workshop

11 ***「意難忘」*** **曾興魁 Shing-Kwei Tzeng**

意難忘綺想曲　為鋼琴四手聯彈及影像、電腦音樂 Audiomulch

本作品取自七零年代大家耳熟的流行歌曲「意難忘」，由五大段落構成。極限主義及浪漫樂派的語彙加上預置電子音樂、電腦音樂 Audiomulch 軟體聲音變化、Midi 驅動影像的視覺效果, 構成豐富的多媒體舞台藝術。
首段由四十八個強力和弦的反覆組成。次段在第二鋼琴極限主義單調神祕的低音反覆中，第一鋼琴彈出「意難忘」浪漫的旋律。第三段為預錄的電子音響，以流行歌手鳳飛飛主唱的旋律片段，以數位音樂擅長的各種變化如移調（pitch bend, pitch schift)、時間的延宕（time strech）等手法剪輯而成。第四段第一鋼琴在高音部朦朧般霧紗的襯托下第二鋼琴彈出「意難忘」浪漫的旋律。第五段第一鋼琴以獨奏的姿態充分發揮「意難忘」浪漫的旋律，第二鋼琴彈奏合成樂器 Prophecy (Korg 公司)對唱，在 Audiomulch 自動播放下結束全曲。這次演出德國 Palindrome 舞蹈團藝術總監美國舞蹈家 Robert Wechsler 編舞演出。
意難忘　歌詞：
藍色的街燈，明滅在街頭，獨自對窗凝望夜色，星星在閃耀，我在流淚，我在流淚，沒人知道。 啊 --------- 誰在唱呀! 遠處輕輕傳來，想念你的想念你的 ，我愛唱的那一首歌。

Unforgettable　text of the song

A blue street lamp,　flickers at the corner,
gazing into the dim night I stand alone by the window,
stars glitter,
I cry,　I weep,
but no one knows.
Eh --------- Who is singing!
Sounding softly from a distance,
missing you, missing you,
that song I love.

The Composer refer above 曾興魁 Shing-Kwei Tzeng

12 ***聲動之外***
Without Rhyme-Sounds

吳疊 Dye Wu

當鑼鼓聲響起，在每個人懷著期待的內心深處，或有所思、各有所託。也許是期待預期的事件發生或是心靈的釋放，無論期待或是突然的衝擊，每個人的內心深處都會感受到不同的餘盪，從美學的角度來看，這就是聲韻，是心聲的靈動。

寫作動機便是因此而起。中西各有審美思惟，但抽象的音樂卻是跨越並超出在思想、情感的美感藝術思惟上。

音樂刻意塑造在中國傳統的平劇鑼鼓與當今科技的電腦音樂上，透過兩者時序矛盾與聲響互動，營造出古今中外、外聲內蘊，聲動之外的超現實虛空世界。

吳疊1973 畢業於國立藝專音樂科。1985 留學法國，就讀巴黎第八大學音樂研究所(Universit de Paris VIII - Saint-Denis)，師事音樂美學泰斗 Daniel CHARLES，專研音樂理論、雕琢美學思想，並在巴黎師範音樂院 (Ecole Normale de Musique de Paris) 隨 Laurent PETITGIRARD 教授研修作曲及電影作曲。
1988 通過考試授予音樂碩士學位。 1989-90　擔任文建會第一屆、第二屆「金帶獎」評審委員。
1993 獲行政院國科會研究獎金。1994 赴法國 Ecole Normale de Musique de Paris 隨 Yoshihisa TAIRA 研習現代作曲技術，並加入法國國家音樂研究組織 IRCAM （Institut de Recherche et Coordination Acoustique/Musique ）參與電腦應用在音樂創作之研究。1995 赴德國 Darmstadt 參與音樂創作與當代作曲技術研習。亞洲作曲家聯盟中華民國總會（ACL-Taiwan）/中華民國作曲家協會（CAROC）會員。曾任中華民國電腦音樂學會（TCMA）理事長。2000 擔任國立台灣藝術大學音樂系主任。 擔任台北市文化局藝文補助評審主席。2002 借調至臺南藝術學院應用音樂系擔任創系主任。策演「浮洲樂浪」系列音樂會、「築樂」音樂作品發表會。製作手機音樂「互動交響樂」協助台北藝術推廣協會策展「2005兩廳院廣場藝術節 」。
近作：
"現象與概念"1001　給人聲與電腦結合舞台動作與視覺投影
"易象 8'01""　電腦音樂
"空"　給小提琴、大提琴、鋼琴與爵士套鼓
概念 I　"真實的假象"　電腦多媒體
"殘局"　給人聲、薩克斯風與電腦

"真實的假象" 給一位打擊樂演奏家
"泛化" 弦樂合奏曲
"擊樂狂草" 定音鼓獨奏曲
"聲動之外" 給平劇鑼鼓與 Max/MSP 即時互動預置電腦音樂
"天" 男聲獨唱與混聲四部合唱

13 *用一隻手指完成的藝術* — **Jeffrey Stolet**

Light, a piece for two flashlights and video analysis software, was originally composed as a demonstration of interactive performance-based music for the musicians of the Sichuan Conservatory of Music, where I was to be in residence for a week May 2008. Light was created to teach a few points about interactive music.
Unfortunately during May the massive 7.9 magnitude earthquake struck the Sichuan province. From my perspective in Beijing, where I was lecturing at the Central Conservatory of Music, I saw tremendously acts of human courage, bravery and heroism as the Sichuan residence picked one another up and through their tears and attacked the enormous challenges posed by the quake with amazing optimism.
So in the end, it was Sichuan who taught me and showed me the light.
This piece is appropriately dedicated to the people of Sichuan.

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Gongs of Tiny Insects was primarily assembled in Tokyo during the week of the 60th anniversary of the world's first atomic bomb attack. The complete title of the composition in English is:
Gongs of tiny insects swarming over still bones,
their tears cool still hot ashes,
sizzle fills the air

Jeffrey Stolet is the invited speaker of this workshop.

14 *「風鈴與落山風傳奇」* — **林幼雄 Yu-Hsiung Lin**

「風鈴與落山風傳奇」原曲係林幼雄博士於 2002 年春節期間「為人聲、絃樂、法國號及電腦」所創作，內涵充滿人文主義對原鄉本土之崇高悲憫情懷，多年來已經在其「台灣阿雄部落格」中無遠弗屆的隨機鳴響。
本曲隨後經原作者改編為室內管絃樂團編制多次演出且廣受歡迎。最近於「八八水災」之後仔細回顧令人格外領悟。
聆賞本曲必先領略下列主題之意境：
1/落山風動機—以時值不全的飄浮動機，描寫來無影去無蹤的落山風，此起彼落穿插於各種樂器群中。
2/無心的屬七和絃—以省略三音的屬七和絃代表現代人失落的心、一再音型變化形成一股股蒼惶的意象表達人們面對天災的惶恐與無助。
3/山神以第三者敘述、土地公有護民衛土的決心各有主題，而後引出增值減

值的恆春民謠加上象徵式的風鈴；於是大地春回、山光水秀萬物重新欣欣向榮。

林幼雄教授，為國立台南大學及屏師校友，國立高雄師範大學外文學士、國立台灣師範大學音樂碩士、美國北科羅拉多大學音樂博士；1990 年高分通過托福、GRE，翌年獲教育部全額公費留美，專攻管絃樂指揮與作曲，1994 年以「傑出研究生」畢業，榮獲博士學位，為在美國北科羅拉多大學得此學位之第一個東方人；林幼雄教授有教無類，恩澤及於中小學與大學生、精神可佩，且於 2006 年被選為中華民國資深優良特殊貢獻教授，榮獲當時教育部部長、行政院長及總統於中山樓賜宴褒獎。

林幼雄教授將以音樂藝術、生活美學及「音樂治療」的精神倡導「全球華人一起來創造和平繁榮新世界」為徬徨的國人及眾生注入一股新生力量。

林教授的指揮，基於師範體系的嚴謹風格，加上美式的幽默活潑，偶爾還蘊藏著歐式的浪漫情懷；林教授曾於早期台南美國新聞處指揮「台南青少年交響樂團」，首創台南鳳凰城合唱團及台南聯合管絃樂團，指導南大、成大、僑生合唱團及管絃樂團屢創佳績，也曾應邀香港、東莞、上海、北京及德國、日本、奧地利等地考察管絃樂團教學；此外，林教授還熱心音樂教育改革與創新，著有「現代指揮藝術—The Arts of Modern Conducting」「電腦輔助音樂教學網行動研究—An Action Research of CAMI inWWW」等書，還多次應邀到淡江大學、師大、逢甲、成大與高師大及中國北京、廣州發表 CAMI,「數位網路音樂」等音樂科技深受歡迎。

林教授認為指揮家總是洞察機先、適時指引、共創新局；林教授雖長年得歐美文化藝術之洗禮，但無時不以「台灣優先」為顧念，其男高音雄邁豪壯且富有東方親切情誼，其創新作品以整合中西音樂理念見長，且以「發現未來美聲」為職志，如「黃石之蝶」、「聯合國」、「為二胡高胡與室內管絃樂團協奏曲」、「千鳥湖之春音樂舞蹈劇」、「黑面琵鷺隨想曲」、「武士刀與和服的對話」、「風鈴與落山風傳奇」、「欲與天公試比高」及「黑水溝 2168」等，都包含了中西音樂創意與巧思，設法將鄉土文化整合當代國際觀。

林教授還是國內少數能唱到 High C 的英雄男高音，其男高音雄邁豪壯且富有東方親切情誼，經常應邀參加重要演出，如「貝多芬第九交響曲」、柯方隆「2000 年福爾摩沙之夢」、「台南府城音樂協會合唱之夜」、「全國中上聯運」及「台南大學校友校慶音樂會」中擔綱男高音獨唱，廣受歡迎。

林教授特別強調「E 世代良性互動」致力提攜英才，他認為音樂是最高尚的國際語言，人才是跨國界的財富；且以" One for All, All for One" 的團隊精神期望「全球華人一起來創造和平幸福新世界」。且以「聞聲救苦、教化為先」，期望富而有德優秀的人們亦當作如是觀。

15 *台灣三景 Three Taiwanese Landscapes*　　黃志方 Chih-Fang Huang

「台灣三景」多媒體電腦音樂作品創作於 2007 年 11 月，主要創作靈感源自於台灣著名的景色，但有別於傳統具象音樂的處理方式，而運用抽象的素材，包括數位合成的碎形與混沌理論所產生「自我類似性」的圖形意象，並整合電腦音樂的聲音素材，利用各式轉換技術與聲音合成，加上演算法作曲與機率分布控制達成各種 「聲音形狀」 之雕塑，完成這首具象多媒體電腦音樂之創作。「台灣三景」包括三個樂章，試將樂曲意境略敘如下：

1. 風吹沙：海灘上看那蒼茫大地，享受微風吹動著碧彩與金沙，和太陽映射的絢麗光芒融合為一體。
2. 墾丁的星空：在海邊的夜晚仰首望群星，剎那間流星劃破寂靜的世界，擁著我的幻想與希望。
3. 合歡飄雪：寒冬的山頂上，俯拾皆是雪花片片。凝視著各種變換的形狀，彷彿進入了未曾存在的異想世界。

Program Note of the multimedia computer music "Three Taiwanese Landscapes"

The multimedia computer music piece "Three Taiwanese Landscapes" was composed in November of 2007. The main idea was inspired by the famous scenes of Taiwan. The composition techniques differ from the conventional music concrete techniques, but use the abstract materials instead, including the digital synthesized graphics with the "self-similarity" features derived from fractal and chaos theory, to integrate the computerized sound samples with proper transformations and sound synthesis. In addition the algorithmic composition with probability and distribution control are used for the various "sound shapes" sculptures, to complete the computer music piece with multimedia concrete. The artistic conception of the piece "Three Taiwanese Landscapes" is as the following description" into three movements:

- Movement 1 "Blowing Sand": Laying down the beach and watching the invisible world, we enjoy the colorful sky and golden sand in the breeze, to fuse the sunlight with gorgeous colors into a whole.
- Movement 2 "Starry Sky of Kenting": To look up to watch the starry sky of Kenting while walking along the seashore, the shooting stars suddenly appear and break the silence of the earth, to brace my fantasy and hope into a dream.

Movement 3 "Drifting Snow of Ho-Huan": In the chilly winter, there are drifting snowflakes all around the top of Ho-Huan mountain. With all kind of transformed shapes stared, it seems to guide me to walk into an imaginary world with great wonders.

【聲音藝廊獲選作品】國立台灣大學博理館 10/18-19, 2009
Audio Gallery Selected Works (BL Building, NCTU) 10/18-19, 2009

作品名稱	作者	作品長度	樂器編制	演出設備
Into Strings (弦內之音)	鄭伊里	4:55	純電子音樂（聲音素材來自鋼琴琴弦）	電腦、音響設備
Deep Field Video	Aaron Acosta	4:40	Electronic	Video to be projected or played on a TV with a sound system
SAKSTI	Georgia Spiropoulos	6:45	Tenor Saxophone, electronics	MacBookPro, Sound Board, Loudspeakers, microphones, MIDI pedal, Reverb, Max/Msp
Bell	楊昕	5:17	Electroacoustics	電腦、喇叭
Lord That Giveth Strength	Juraj Kojs	7:02	Viola and electronics	MAX/MSP, microphone, 2-channel audio system
Prato Unico	Marcelo Ohara	7:30	Acousmatic Piece 4 channels	Speaker, mixing table, computer, sound card
Engram	林美玲	7:00	electronic	speaker
辯解	何佻倢	5:57	電腦	播放器，喇叭
Waterdrop	呂昀儒	4:48	電腦	喇叭
舞、影、腳	林育誼	10:00	電腦	投影機、螢幕、電腦、webcam、mic、黑光燈
謎航	林思妤	4:45	電腦	電腦、音響
TryAngle	林盈婷	4:23	電腦	電腦、音響
再唱老歌仔－入王婆店	陳宜惠	4:24	電腦	電腦、音響
虛實之門	陳明穎	4:15	電腦	電腦、音響
舞蹈	陳建榜	8:25 | 10:18	自製呀克力台、電鍋、米	會議桌一張、喇叭、延長線、高功率投影機
Sonicwind	黃耀萱	4:10	電腦	電腦、音響
奔	楊語庭	4:27	電腦	電腦、音響
彈指之間	黎青雲	4:06	電腦	電腦、音響
游移	蘇琬珺	3:28	電腦	電腦、音響
奇幻時鐘	吳宜蓁	4:56	電腦	電腦、音響

【演出者】
Performers

長笛：林蕙蕙 Flute: Yi-Hui Lin

畢業於國立藝術學院音樂系。1995 年獲法國巴黎師範音樂院（Ecole Normale de Musique de Paris）最高演奏家文憑（Concertiste）及法國國立 Rueil-Malmaison 音樂院高級演奏家文憑第一獎、室內樂第一獎。曾師事牛效華、樊曼儂老師及目前為法國國立管絃樂團首席長笛 Philippe Pierlot，朗帕爾高徒工藤重典，並多次受教於 Aurèle Nicolet，Andras Adorjan 與 Robert Aitken 等名師。曾多次內外比賽獲獎，1994 年獲國際婦女藝術家聯盟（U.F.A.M.）比賽第一獎並獲全體裁判一致通過及參加國際布達佩斯長笛一賽，進入複賽資格。1997 年 8 月入選受邀參加第四屆國際神戶長笛大賽。1995 年返國至今，多次舉行獨奏會、參與多項音樂節活動、獲選台灣省立交響樂團主辦之樂壇新秀系列音樂會；並積極參與室內樂演出。現任教於交通大學音樂研究所、台北市立師範學院、國立台北師範學院、新竹師範學院、文化大學等校。

Ms. Lin graduated from the National Institute of the Arts' music department. In 1995, she received Diplome superrieur de Concertiste from the Ecole Normale de Musique de Paris, and 1st prix de concertiste and musique de chambre from the Conservatoire Nationale e Region de Rueil-Malmaison. She has studied under Hsiao-Hua Niu, Man-Nong Fan, and Philippe Pierlot (the principle flutist of the Orchestre National de France), and one of Maestro Rampal's excellent students, Shigenori Kudo, and Ms. Lin was also taught many times by virtuosos such as Aurèle Nicolet, Andras Adorjan, and Robert Aitken. Having won many competitions locally and internationally, she also won the first place of the UFAM competition, and was also the first place by unanimous agreement of the judges at the first stage of International Flute Competition in Budapest, and entered into higher level of the competition. In August 1997, she was invited to participate in the Fourth International Kobe Flute Competition. Since her return to Taiwan in 1995, she has held many recitals, and participated in many music festivals, and was selected by the Taiwan Symphony Orchestra for the new artist series music concerts. Ms Lin also enthusiastically partakes in ensemble performances. Now she teaches at Institute of Music at the National Chiao-Tung University, Taipei Municipal Teachers College, National Taiwan Normal University, National Hsin Chu Teachers College, Culture University, etc...

吉他：黃修禮 Guitar: Alfredo Huang Huang

黃修禮，1954 年出生於高雄市，先後師事張喬治及黃潘培二位老師學琴，中原大學電機系畢業，於 1980 年赴西班牙馬德里皇家高級音樂學院深造，師事吉他主任 Don J. Ariza 教授，曾連獲三次音樂院榮譽獎，並於 1982 年以第一名成績取得演奏家文憑，1984 年再以優異成績取得吉他高級教師文憑，並獲西班牙文化部獎學金參加 Santiago de Compostela 西班牙音樂研習營中 Segovia 講座。
出國前， 曾接受 S. Behrend、O. Ghiglia 等吉他大師之指導。

留西期間，參加了吉他大師 A. Segovia、A. Carlevaro、J. Williams 及 J. L. Gonzalez 等大師之講習會。1983 年 12 月偕同其韓籍夫人女高音高淑敬女士返國巡迴演出，並且在漢城、Madrid、Valencia 等地演出。1984 年 9 月返國，1985 年應邀參加省教育廳秋季藝術季，於基隆、彰化及台中文化中心演出。現任教於國立台灣師範大學音樂系及實踐大學音樂系。

雙簧管：謝宛臻　Oboe: Wan-Chen Hsieh

曾獲德國第七屆「韓德爾國際雙簧管比賽」首獎，為獲得此獎項的第一位亞洲人。於 2008 年以首張專輯「謝宛臻 OBOE 新美聲」獲第十九屆金曲獎最佳古典音樂專輯獎，並於同屆金曲獎以另一張專輯「越界嬉遊」獲最佳跨界音樂專輯入圍，2009 年再度以新專輯「韓德爾　無盡藏」獲得金曲獎最佳古典音樂專輯入圍。德國 Mitteldeutsche Zeitung 形容謝宛臻的演出「**……當她在演奏時仿佛就像變了個人，全然地投入，充滿激情，炫目耀眼，毫無瑕疵……**」

薩克斯風：蔡佳修　Saxophone: Chia-Hsiu Tsai

蔡佳修先生曾多次於重要之國際薩克斯風會議中發表新的作品。於 2001 年八月之日本濱淞國際管樂研習會中獲選為“新人賞”。 2002 年 應邀於 西安國際單簧藝術節中演講大師班之授課及四重奏演出。曾客席於蘇俄基洛夫交響樂團、國家音樂廳交響樂團、台北市立交響樂團、國立台灣交響樂團與長榮交響樂團等 。曾與國立台灣大學管樂團、交響樂團、國立台灣師範大學、東吳大學音樂系、實踐大學音樂系、雅頌以及國立台灣交響樂團附設管樂團合作，巡迴演出作曲家 P. Dubois、A. Glazounov、 Paul Creston、曾興魁“天問”及 Husa 之薩克斯風協奏曲。

單簧管：林 慶 俊　Oboe: Ching-Chun Lin

1997 年獲選為美國明尼蘇達的 TED MANN MUSICIANS，在 TED MANN 音樂廳擔任經常性之演出，並經常於明尼蘇達地區做巡迴演出。1997 年 11 月應邀與挪威的 BERGEN WOODWIND QUINTET 在 TED MANN CONCERT HALL 同台演出。

2005 年 7 月應邀在日本舉行之國際單簧管音樂節中舉行獨奏演出；同年 8 月應邀在中國西安單簧管音樂節中舉行獨奏會並舉辦講習會。2006 年擔任臺灣管樂協會常務理事。2009 年擔任功學社 Jupiter 樂器公司單簧管代言人於大陸地區舉行多場巡迴音樂會。目前積極從事單簧管演奏、管樂教學及推廣之工作 。

大提琴：歐陽伶宜　Cello: Ling-yi Ou Yang

歐陽伶宜，高雄市人。國立臺灣師範大學音樂系畢業後，即赴美國波士頓新英格蘭音樂學院（New England Conservatory, Boston）跟隨大提琴教授 Mr. David Wells，取得大提琴演奏碩士學位。2000 年 7 月，獲美國密西根州立大學音樂系全額獎學金，拜師於大提琴家 Suren Bagratuni 門下，受聘擔任其助教，於 2002 年 12 月取得大提琴演奏博士學位。現為東吳大學音樂學系專任助理教授，並兼任於國立臺灣師範大學音樂系。

伶宜自幼即接受完整之專業音樂教育訓練，學習鋼琴與大提琴，成績優異，皆以第一名佳績保送各級音樂學校。尤其在大提琴演奏方面，一直表現傑出，常獲各類獎學金及比賽大獎，其音樂演出的形式多變，演出活動更遍及國內外。1987、1989、1990、1991 年臺灣區音樂比賽中均獲大提琴獨奏第一名；1992 年 2 月受邀參加第三屆總統府介壽館音樂會演出；1994 年獲第九屆臺北市立交響樂團協奏曲比賽大提琴組第一名；1998 年其所屬新英格蘭音樂學院絃樂四重奏，贏得室內樂比賽第一名，獲得獎助金，並受邀至麻省各地公演，均深獲好評，更於 1999 年 6 月與其絃樂四重奏獲全額獎學金赴加拿大 Banff Center 參加室內樂夏令營，於當地公開演出；2000 年 9 月，應美國地區臺灣人聯合基金會（Taiwanese United Fund）之邀請，參加跨世紀 TUF 臺灣文化之夜，與文建會主委陳郁秀女士及臺灣師大廖嘉弘教授於加州共同演出；2000 年 11 月獲國立臺灣交響樂團舉辦之第四屆臺灣區協奏曲大賽優勝，其與樂團合作 Tchaikovsky "Variation on a Rocco Theme" 之演出，更深獲讚賞；2001 年 4 月獲密西根州立大學教授之青睞，參與教授聯合音樂會"Cello Pous"之室內樂演出；2001 年 7 月，受邀返國與廖嘉弘教授帶領之台北世紀青年管絃樂團以及青年音樂家廖俐伶、林瑋祺於台北國家音樂廳及國立清華大學協奏演出 Tchaikovasky "Variations on a Rococo Theme" Op. 33 以及 Beethoven "Triple Concerto for Violin, Cello, Piano" Op. 56；2002 年 2 月應密西根州立大學 Philharmonic Orchestra 之邀請合作演出 Haydn "Sinfonia Concertante for Violin, Cello, Oboe, Bassoon"；2002 年 8 月為宏揚大提琴合奏之美，返國與師大陳哲民教授所帶領之”大提琴的家——合奏樂團”於台北國家音樂廳及高雄中正文化中心至德堂協奏演出大提琴版 Antonio Vivaldi "The Four Seasons"秋、冬樂章。返國後，除致力於大提琴之演奏及教學外，並積極投入各類型室內樂之活動演出。

鋼琴：何宛茹　Piano: Wen-Ju Ho

主修鋼琴，何宛茹。新竹市人。主修鋼琴，現就讀新竹教育大學碩士班一年級，師事陳惠文教授。曾就讀國立中山大學音樂系和新竹高中音樂班，主修鋼琴，曾師事林雅敘老師、王雪枝老師、劉乃榮老師、顏秀慧老師；副修擊樂，曾師事鄭醴丰老師、張宜雯老師。曾獲 2005 年台中文化盃音樂大賽鋼琴青年組第二名，多次參加國內重要相關音樂演出活動。

鋼琴：何宜儒　Piano: Yi-Ju Ho

何宜儒，台灣宜蘭人，主修鋼琴。曾就讀於竹南國小、建華國中音樂班，現就讀於國立新竹教育大學音樂研究所二年級。曾師事鄭碧煌老師、楊維娟老師、李美華老師，現師事陳惠文教授。

五歲時由鄭碧煌老師啟蒙習琴，後就讀於竹南國小音樂班，成為第一屆學生。主修鋼琴，副修長笛。國小四年級時，獲台灣省音樂比賽苗栗縣賽鋼琴國小組第二名。

國中就讀於建華國中音樂班。主修鋼琴，副修中提琴，並加入學校絃樂團。曾獲台灣省音樂比賽新竹市賽鋼琴國中A組第一名，代表新竹市參加省賽。又與同學組成鋼琴五重奏參加比賽，第一次嘗試室內樂的演奏。

高中與大學時期雖未就讀音樂班，但仍積極參加音樂性社團以及持續鋼琴的學習。高中時加入國樂社，學習琵琶，曾通過琵琶考級第一級檢定，也曾代表苗栗縣參加台灣省音樂比賽。大學時因對古典文學的興趣，就讀國立中央大學中國文學系，在校期間參加絃樂社，曾加入四校聯合大學管絃樂團至法、德、捷克等地巡迴演出，也曾代表桃園縣，獲台灣省音樂比賽鋼琴大專B組第二名。

自小喜愛音樂，對於各種表演型態也很感興趣，因此學習多樣樂器、嘗試樂團及室內樂的演奏等，這些都是很珍貴的經驗。大學畢業後，考取國立新竹教育大學音樂研究所，主修鋼琴，師事陳惠文教授。老師對我的啟發頗大，影響甚深。希望未來可以發揮所長，推廣古典音樂，並在音樂上有更亮麗的表現。

擊樂：黃雅綾　Percussion: Ya-Ling Huang

法國國立馬爾梅森音樂院演奏文憑。從小學習打擊樂，由徐伯年老師啟蒙，師事朱宗慶、吳思珊、鄭吉宏等。1997年加入十方樂集打擊樂團，曾多次參與管弦樂團及打擊樂團的演出。

2002年七月畢業於國立台北藝術大學，同年九月赴法國馬爾梅森音樂院進修打擊演奏文憑，受教於Gaston Sylvestre，並隨Francois Bedel學習伊朗手鼓，隔年4月於法國馬爾梅森音樂院演奏廳舉辦兩場音樂會，獲得所有評審一致通過給予「室內樂第一獎」文憑，並同時獲得「評審一致通過並恭賀優越級數第一獎」及「評審一致通過傑出級數獎」。在法期間曾多次在巴黎發表現代擊樂作品。現任教於東海大學、實踐大學、台北東山國中、私立光仁中學音樂班、台北市立福星國小音樂班、台北景文高中附設優人神鼓表演班。

擊樂：戴健宇　Percussion: Chien-Yu Tai

花蓮人，自幼學習鋼琴。實踐大學音樂系畢業，主修打擊樂。高一開始學習擊樂，啟蒙於林靜怡老師，後師事徐伯年老師，於國中、高中擔任管樂團學生指揮，花蓮青年聯合管樂團幹部及團員。

2002年考入國立嘉義大學，2003年擔任音樂系之年度音樂劇公演「美麗世界」鋼琴伴奏。副修鋼琴，曾師事鍾昭華老師、黃正萬老師、林淑芬老師、林香蒂老師。

曾任彰化縣溪湖國中、台中市安和國中、僑真國小、協和國小、羅東國華國中管樂團打擊分部指導老師，幼獅管樂團、幻響管樂團團員，2005 年加入十方樂擊打擊樂團。

擊樂：吳亞璇　Percussion: Ya-Hsuan Wu

從小學習鋼琴，國中正式學習打擊樂，畢業於雲林國中音樂班，彰化高中音樂班，現就讀台灣藝術大學音樂系四年級，曾師事陳玟玎老師、鐘耀光老師，現師事陸淯姿老師。於 2007 年加入十方樂集；2008 年台灣藝術大學協奏曲比賽擊樂組優勝，並於中山堂和管絃樂團共同演出。

擊樂：簡妤安　Percussion: Yu-An Chen

四歲起開始學習鋼琴，曾師事，王麗玲老師、吳靜惠老師，林秋孜老師；十一歲開始學習打擊樂，啟蒙於吳思珊老師，曾師事黃雅綾老師，現師事徐伯年老師。目前就讀東吳大學音樂系三年級，並為十方樂集打擊樂團團員。

※名單按演出場次順序排列。

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