Taiwan Digital Art Pulse Stream Plan:
The First Phase
「Body、Gender、Technology」Digital Art Exhibition

台灣數位藝術脈流計畫－脈波壹

身體‧性別‧科技

數位藝術展

曾鈺涓

世新大學公共關係暨廣告學系 助理教授
台灣女性藝術協會副理事長

以數位藝術史作為展覽主體，首先將面臨何為「數位藝術」的提問，探究台灣數位藝術相關研究文獻，以及透過多次與藝術家、研究者的討論中，無法達成共識的爭論點在於，每個人對於數位科技究竟為工具、媒介抑或媒材的認知不同，同時對於作品呈現的數位化程度與否，亦有其不同的想法。此不僅影響了何為數位藝術，也影響數位藝術史的建立與年表收錄範疇。如何從駱麗真匯整的台灣新媒體藝術龐大與複雜的年表中，定義出「台灣數位藝術史」年表，成為此展覽最大的挑戰。因此本文將回歸到數位藝術命題的問題上，透過討論台灣的研究者與策展人，與重要公部門與私人單位，對於數位藝術的命題定義與思考之探討，進一步地探究數位藝術的本質命題。本文非意欲討論名詞使用的正確性，或企圖決定數位藝術的最終定義，而是希望透過文獻理解台灣對於此以科技表現的藝術形式之命題，並進而提出適足於支撐此展覽的數位藝術範疇架構。

臺灣常使用的中文名稱為：「科技藝術」、「電腦藝術」、「新媒體藝術」與「數位藝術」，英文名稱為則 Art & Technology, Techno Art、Technological Art、Computer Art、New Media Art、Digital Art 等。（表一）國際學者則除了上述名詞外，尚提有其他名詞，如 Oliver Grau 與 Frank Popper 以「虛擬藝術」(Virtual Art) 一詞定義並強調數位藝術中的虛擬存在特性，強調參與者於環境中的沈浸與虛擬在場。[1]Stephen Wilson 則以「資訊藝術」(Information Art) 定義結合藝術、科技與科學等跨領域結合的創作，強調「身處於此資訊社會裡，創造、行動與觀念分析都是當代文化與經濟生活的中心，在我們的文化、科學與科技資訊的關鍵核心是在於資訊」(Wilson, 2002)

在西方的數位藝術發展脈絡中，從 50、60 年代開始，曾以「電腦藝術」為起始，討論透過程式數理運算所產生的衍生圖像，今日軟體工具的普及，各種類型的創作已包括 2D 影像、3D

影像、動畫與多媒體等。「科技藝術」與「藝術與科技」名稱使用，可回溯到 1966 年由 Billy Kluver 與 Robert Rauschenberg 組織成立的團體「Experiments in Art and Technology」(E.A.T.)，他們以「藝術與科技」為名進行藝術與科技的合作創作。Robert Atkins 於 1990 年編著出版"Art Speak"中，也以「Art and Technology」與「High-Tech Art」兩個類別，定義以科技作為創作工具的藝術表現。(Atkins, 1990)。

1977 年，台灣方因楊英風召開「雷射推廣協會」第一次籌備會議，將雷射藝術與科技引進台灣，然而，當時並未造成太大風潮。1988 臺灣省立美術館開館首展之一「尖端科技藝術」(High Technology Art)，展覽內容涵蓋了光藝術 (Light Art)、動力藝術 (Kinetic Art)[2]、錄像藝術 (Video Art)、雷射藝術 (Laser Art)、電腦繪圖與藝術 (Computer Graphics and Fine Arts)、人工智能藝術 (Cybrog Art)。(台灣省立美術館 , 1988)

1990 年，李佩穗自日本留學返台後，在台北市立美術館舉辦「電腦藝術展」，帶回了「電腦藝術」一詞，1992年出版"電腦藝術Computer Art"一書，收錄她與河口洋一郎的碎形（Fractal）電腦藝術創作，並定義「把某種新觀念，獨特的美感，以電腦而創作出不同的表現，我們稱之為『電腦藝術』」(河口洋一郎 , 李佩穗 , 1992) 1992 年駱麗貞自紐約返台，發表了 '電腦與藝術對話' 一文，介紹以美國為主的電腦藝術創作，她於文章開始即定義「電腦藝術」為：「由電腦完成的純藝術。」她以第二屆「新表現雙年會」(The Second Emerging Expression Biennial) Patric D . Prince 的觀點為主軸，介紹了三種電腦藝術類型：第一種「視電腦為設計、素描或模擬作品的工具，然後再轉換以傳統媒材來完成」[3]；第二類為「視電腦本身為媒材，作品可能直接呈現在電腦螢幕上或者利用電腦的周邊設備來控制局部或整件作品」；第三類為「視電腦為視覺研究上的啟發對象，他們 (藝術家) 檢視科技如何影響人的狀況，而人和電腦的關係又如何。」(駱麗真 , 1993)。從駱麗真的觀點可看出，電腦藝術不僅僅是在於視覺工具的應用，更在於打破刻板印象中認為「電腦藝術」等同於電腦繪圖 (Computer Graphic) 的誤謬。

---

1 Oliver Grau 強調參與者於環境中的沈浸感，並從藝術史中去溯源虛擬實境。(Grau, 2003) Frank Popper 則強調科技應用所產生的虛擬在場，強調以「光」構成的介面所呈現的虛擬特性及其在數位藝術創作中的重要性。(Popper, 2007)

2 Kinetic Art 在此翻譯為動力藝術，然又可翻譯為機動藝術。

3 作者以紐約藝術家 Kathleen H. Ruiz 的作品 Repository Construct 為例，說明第一種類型的電腦藝術，Ruiz 以電腦草繪後，將電腦圖像再轉繪於草皮紙上 (papyrus paper)，見駱麗真 . (1993, 5.1). 電腦與藝術對話 . 藝術貴族 , 41, 68-71.

科技藝術一詞可以回溯到 1993 年，蘇守政（1992-98 科技藝術中心主任）推動成立台北藝術大學科技藝術中心[4]，2001 年台北藝術大學正式成立科技藝術研究所（Graduate School of Arts & Technology）[5]。之後，「電腦藝術」的名稱漸漸被「科技藝術」一詞所取代。2002 年國巨基金會與亞洲文化協會合作，創設「國巨科技藝術創作獎」(Yageo Tech-Art Award)[6]，2006 年鳳甲美術館與國家文化藝術基金會提出「科技藝術創作發表專案」補助專案，提供科技藝術創作者充裕的創作資源。獲獎藝術家創作類型涵蓋數位影像、互動裝置、錄像藝術、網路藝術與聲音藝術等[7]。2003 年台北立美術館策辦《靈光流匯 - 科技藝術展》，德國策展人華安瑞對「科技藝術」一詞，提出清楚界定：「靈光流匯所展現的全然是以機械的、電動的以及／或是電子媒體為基礎或媒介而產生的藝術。」(華安瑞 , 2003) 邀展的作品形式主要以攝影與錄像為主，並包括了電子機械裝置與聲音藝術，打破了一般人對於科技藝術的定義 。[8]

曾鈺涓（所以然藝術實驗室） Who 系列作品 - 在場
互動裝置 2008
「科光幻影 2008- 對話之外」第三屆國家文化藝術基金會科技藝術創作發表專案於國立台灣美術館。攝影：曾鈺涓

曾鈺涓 李家祥 Flow 網路互動裝置 2006
「Boom！快速與凝結新媒體的交互作用－臺澳新媒體藝術展」於關渡美術館。
攝影：曾鈺涓

在此同時，承續自媒體藝術 (Media Art) 的新媒體藝術 (New Media Art) 一詞，強調「新科技」的運用與實驗，使其成為藝術表現的一種可能。王嘉驥 (2004) 定義「新媒體藝術」是「媒體藝術」的延伸或深化，只是更重視數位影音、網絡與互動媒體科技的運用，藝術的媒體特性。2006 年台北市立美術館展出了龐畢度中心所典藏的 33 件錄像、影片與影像裝置作品，並將此展覽命名為「龐畢度 新媒體藝術」，Chistine Van Assche 依 Lev Manovitch 的新媒體理論，提出其定義為：「新媒體作品必定都是透過數位規格設備（錄影帶與錄音帶、光碟、硬碟、網站所完成的藝術作品，但也包含源自傳統媒材，為了展出的需要而轉錄到數位規格設備上的作品（如電影）。」(克莉絲汀‧凡雅絮, 2006) 而 2007 年國立臺北藝術大學、國立臺灣藝術大學、國立臺南藝術大學、以及國立澳大利亞大學新媒體藝術中心共同主辦「Boom！快速與凝結新媒體的交互作用－臺澳新媒體藝術展」一展中，陳永賢為文提出「澳洲政府⋯⋯，而今更致力於發展新媒體藝術之數位電影、錄像、電腦動畫、互動式媒體、人機介面、虛擬實境、電腦遊戲與數位內容產業之結合⋯⋯。」(陳永賢 , 2007) 此展覽認為新媒體藝術是涵蓋範疇擴及至電腦遊戲與數位內容產業，此亦呼應官方對「數位藝術」一詞的定義。

台灣開始使用「數位藝術」一詞，應是從 2000 年宏碁基金會成立「宏碁數位藝術中心」開始，同年舉辦了「國際數位藝術紀」展覽，並出版了 "數位藝術：歐洲：奧德荷三國採樣報告" 一書，「數位藝術」一詞漸漸為人所採用，並與「科技藝術」、「媒體藝術」、「新媒體藝術」名稱各有其擁護者。
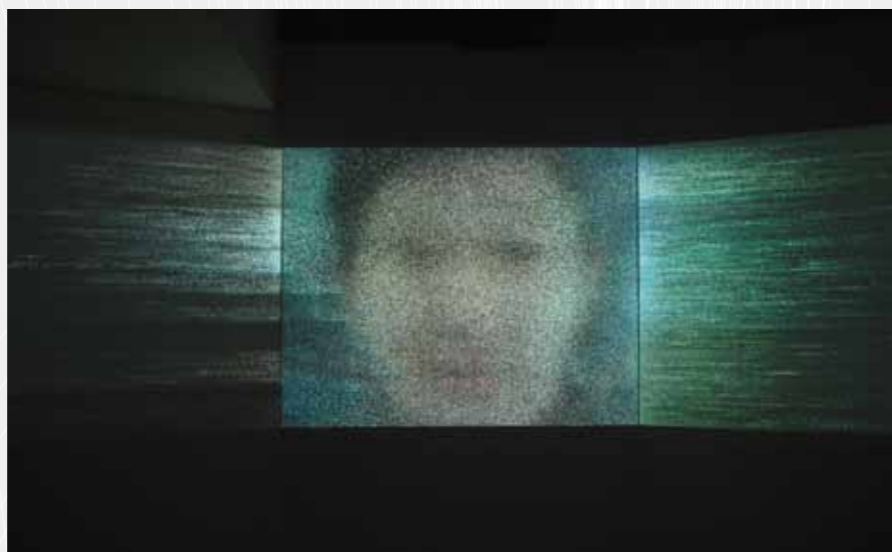
2001 年陳麗秋定義「數位藝術」是「經過數位化的過程方法、手段產生的藝術創作，稱為

4 1993 年許素朱老師到職後導入更完整的技術規劃。自 1993 年起該中心每年皆舉辦科技藝術展，集結台灣從事媒體藝術創作藝術家，從而能一探當代創作現象：「'93' 科技藝術展－科技的詩情，新藝術的試驗」、「'94' 科技藝術展」、「'95' 科技藝術專題展－電子影像在關渡，迎接電影一百年」、「 '96 科技藝術專題展 –New Paradise of Image and Imagination」。參見袁廣鳴 . (2007). 初探台灣媒體藝術發展脈絡 1979~2000. Retrieved 11.1, 2008, from http://mfa.techart.tnua.edu.tw/~gmyuan/mediaart/?p=82

5 設立沿革與宗旨 . Retrieved 11.2, 2008, from http://mfa.techart.tnua.edu.tw/1_intro/purpose.html。科技藝術研究所已於 2010 年改稱為新媒體藝術學系，設置大學部與研究所。

6 獲獎人包括林俊廷 (2002)、蕭聖健 (2003)、吳達昆 (2004)、徐瑞憲 (2006)、蘇匯宇 (2008) 等人

7 第一屆獲獎者：王俊傑、呂凱慈、吳天章、林書民、黃心健、蔡安智。第二屆獲獎者為：林其蔚、張博智、吳季璁、林俊廷、蔡宛璇。第三屆獲獎者為：宋恆、吳達坤、林昆穎、陳志建、曾鈺涓及盧詩韻

8 華安瑞在文中談到「媒體藝術」一詞的神秘不易理解的特性，「使人聯想到未來主義的嚴格概念，那是與所有

文化領域內既有的傳統的徹底斷裂」，因此他不願意使用「媒體藝術」之命名。(華安瑞 , 2003)

數位藝術」(陳麗秋,2001) 此定義,廣為年經學子引用,而 2002 年,行政院文化建設委員也採用廣義的定義,定義「數位藝術」是統整了以數位科技表現的各種創作形式,涵蓋了數位音樂、互動裝置、數位影像 (CG)、數位動畫、電影與網路創作等。2005 年葉謹睿出版了《數位藝術概論》,以「數位藝術」統稱了包括電腦藝術、網路藝術、數位攝影影像、動態影音藝術、軟體藝術與新媒體藝術等各種表現形式,他解釋「現代的電腦器材立足於數位科技 (Digital Technology),同時,數位化 (Digitalization) 的概念,也對於藝術創作的方向與特質有絕對性的影響,因此在藝術相關的論述中,普遍以數位藝術 (Digital Art) 一詞來取代電腦藝術,統稱所有的電腦藝術。」強調「數位藝術所界定的,並不是一種特定的風格或理念,它比較接近油畫、木雕或攝影等等名詞,規範的是創作的工具或呈現的方式,⋯⋯」(葉謹睿 , 2003)

漫遊者 -2004 國際數位藝術大展於
國立台灣美術館。攝影:曾鈺涓

「電腦藝術」、「科技藝術」與「新媒體藝術」,強調的是以科技工具與透過科技媒介所產生的創作表現的物體性特質。因此在此架構下,根據其媒介與媒材的科技特質,作為其命題主題,是此三種名詞的重點。官方定義的「數位藝術」,偏向於數位創意產業,期待提昇數位內容產業的產值與競爭力。而陳麗秋與葉謹睿以「工具論」的觀點去解釋「數位藝術」,則與多數人對「科技藝術」、「電腦藝術」、「媒體藝術」與「新媒體藝術」認知相同。其籠統定義中,主要仍以電腦的工具性為主要考量面向,強調技術應用,科技作為一種媒材工具的定義。

定義「數位藝術」需由定義「數位」(digital) 與「科技」(technology) 為始。「數位」的原文 digital,描述以「是 (positive)」與「否 (non-positive)」狀態進行衍生 (generate)、執行 (processe) 與儲存資料 (store) 的科技,資料被轉換成為以 0 與 1 所組合而成的數串,每個數字被稱為位元 (bit,

binary digit),一定數量的位元所組成的串,則稱之為位元組 (byte),作為一個單位來處理的一個二進制的字元。(Halnon, 2002) Negroponte 形容位元像人體內的 DNA 一樣,是資訊的最小元素,雖然不具顏色、大小或重量,但卻是一種存在的狀態。(尼葛洛龐帝 , 1995) 因此,數位的意義,不僅在於技術定義,也是攜帶眾人存在資料結構的無限世界

因此如透過海德格的工具論與本質論 (許良 , 2005),以科技工具的執行、變異與發生,再重新理解科技的存在狀態,透過科技去重新認識被遮蔽的事物本質,透過「本質論」去理解科技與人、與世界的關係,瞭解現代科技所啟發的存在世界如何顯現自身,才能理解現代科技的本質。(許良 , 2005)。

在此觀念下,本文所提出的「數位藝術」定義,需涵蓋數位科技工具所創作的創作表現,而其概念則需討論作為人存於此科技構築的世界所面臨的生存狀態以及其所啟發的存在,均可被納入數位藝術的討論範疇當中。

科技的本質,並非僅在於工具使用的過程與最後呈現的結果,而是強調透過科技工具的使用,去瞭解科技所建構的科技文明與人的存在狀態之改變。(馮黎明 , 2003) 數位工具產生數位革命,位元構築的新世界,改變了整體的資訊社會的經濟模式,也使得人類思維成為一種以「位元」為基礎的系統性思維。數位科技不僅主導了藝術創作的工具使用,更重要的是在於其影響了整體社會、文化與生活的發展脈絡,也影響了藝術家思考的模式與創作的主題。

正如 Christiane Paul 認為,透過定義與分類,或許對於如何闡明此類藝術的媒體特質有幫助,但是也會因為定義上的侷限性,限制了理解一個藝術形式的可能性,特別是當此類藝術形式仍處於不斷演化的狀態當中 (Paul, 2003)。此文因篇幅限制,並無法深入辯證,因此,此定義的目的,是在於釐清此類藝術形式的本質為何,並且僅是做為本展覽界定數位藝術史之目的。

年代	單位	中文	英文
1988	臺灣省立美術館	尖端科技藝術展	High Technology Art
1988	臺灣省立美術館	日本尖端科技藝術展	Japan High Technology Art Exhibition
1990	台北市立美術館	李佩穗「電腦藝術展」	Computer Art
1992	台北藝術大學	科技藝術中心	Center for Art and Technology
1999	宏碁基金會	宏碁數位藝術中心	Acer Digital Arts Center
2000	宏碁數位藝術中心	國際數位藝術紀	ArtFuture 2000
2001	台北藝術大學	科技藝術研究所 2010 年更名為新媒體藝術學系	Graduate School of Arts & Technology
2002	國巨基金會	國巨科技藝術創作獎	Yageo Tech-Art Award
2003	台北市立美術館	靈光流匯 - 科技藝術展	Streams of Encounter-electronic media based artworks
2004	國巨基金會	國巨科技藝術國際學術研討會	Yageo Techart International Symposium
2005 ～	鳳甲美術館＆國家文化藝術基金會	「科技藝術創作發表專案」補助計畫	Techno Art Creation Project
2004	台北當代藝術館	數位城市・媒體昇華——新媒體藝術展	Digital Sublime
2004	國立台灣美術館	漫遊者 -2004 國際數位藝術大展	NAVIGATOR - Digital Art in the Making
2004	國立台灣美術館	台灣數位藝術知識與創作流通平台	Taiwan Digital Art and Information Center
2005	國立台灣美術館	快感－奧地利電子藝術節 25 年大展	Climas-The Highlight of Ars Electronica
2006	台北市立美術館	龐畢度中心新媒體藝術	New Media Collection 1965-2005 Centre Pompidou
2007	國立台灣美術館	數位方舟	Digial Arts Creativity and Resource Center
2007	國立臺北藝術大學、國立臺灣藝術大學、國立臺南藝術大學、國立澳大利亞大學新媒體藝術中心	Boom！快速與凝結新媒體的交互作用－臺澳新媒體藝術展	Boom! An Interplay of Fast and Frozen Permutation in New Media
2006~	台北市文化局	台北國際數位藝術節	Digital Art Festival Taipei
2009~	台北市文化局	台北數位藝術中心	Digital Art Center, Taipei

表一：臺灣重要展覽標題裡或機構名稱所使用的名詞命名

參考書目

Atkins, R. (1990). *ArtSpeak : a guide to contemporary ideas, movements, and buzzwords*. New York: Abbeville Press Publishers.

Grau, O. (2003). *Virtual art : from illusion to immersion* (Rev. and expanded ed.). Cambridge, Mass.: MIT Press.

Halnon, M. (2002). *2002 Digital Dictionary*. Retrieved Nov.19, 2008, from www.netaonline.org/pd-digitalglossary.rtf

Paul, C. (2003). *Digital art*. London ; New York: Thames & Hudson.

Popper, F. (2007). *From technological to virtual art*. Cambridge, Mass.: MIT Press.

Wilson, S. (2002). *Information arts : intersections of art, science, and technology*. Cambridge, Mass.: MIT Press.

王嘉驥 (2004)。〈台灣媒體藝術發展評述〉。《漫遊者—數位媒體的行進與未來》國際論壇峰會。

台灣省立美術館 (Ed.)(1988)。《尖端科技藝術展覽》。台中：台灣省立美術館。

尼葛洛龐帝 (1995)。《數位革命》（齊若蘭 , Trans.)。台北：天下文化出版股份有限公司。

克莉絲汀・凡雅絮 (2006)。〈新媒體藝術作品的歷史與博物館學面向〉。In 簡正怡、連雅琦、陳盈瑛 (Ed.),。《龐畢度中心 新媒體藝術》 (pp. 16-37)。台北：典藏藝術家庭股份有限公司。

河口洋一郎，李佩穗 (1992)。《電腦藝術 computer Art》。台北：藝術圖書公司。

許良 (2005)。《技術哲學》（一版 2 刷 ed.)。上海：復旦大學出版社。

陳永賢 (2007)。〈臺澳新媒體藝術發展現況〉。In 石昌杰、林珮淳 (Ed.)《BOOM! 快速與凝結新媒體的交互作用—臺澳新媒體藝術展》 (1 ed., pp. 31-33)。台北：國立臺灣藝術大學。

陳麗秋 (2001, 11)。〈從數位藝術之世界潮流談台灣藝術教育之現代化〉。《歷史的長廊中頻頻相會－資訊科技與藝術教育國際學術暨實務研討會論文集》。桃園。

華安瑞 (2003)。〈靈光流匯〉In 張芳薇 (Ed.)。《靈光流匯 - 科技藝術展》 (pp. 10-13)。台北：台北市立美術館。

馮黎明 (2003)。《技術文明語境中的現代主義藝術》。北京：中國社會科學出版社。

葉謹睿 (2003)。《藝術語言@數位時代》。台北：典藏藝術家家庭股份有限公司。

駱麗真 (1993, 5，1)。〈電腦與藝術對話〉。《藝術貴族》。41, 68-71。台北：藝術貴族雜誌社。

Tools, Medium, Media? The Proposition of Digital Art's Essence

TSENG Yu-Chuan

Assistant Professor, Department of Public Relations and Advertising, Shih Hsin University

Vice Chairman, Taiwn Women's Art Association

When organizing an exhibition about the history of digital art, one is always confronted with the question, "What is digital art?" Even through much analysis of literature about digital art in Taiwan and discussions with numerous artists and researchers, a consensus could not be reached due to the following reason: Each person has a different understanding of digital technology as a tool, medium, or media. Additionally, each person holds a different opinion about the degrees of digitization in an artwork, if any. This not only affects the resulting manifestation of digital art, but also its chronological record. How is "Taiwan's Digital Art History" defined when based off Li-Chen Loh Sappho's massive and complex chronological compilation of Taiwan's new media art? This is ultimately the greatest challenge for this exhibition. Therefore, this essay will revisit an essential question: what is the proposition of digital art? Through discussions with researchers and curators, as well as relevant government departments and private entities, digital art's proposition is explored to gain a better, more in-depth understanding of the intrinsic nature of digital art. The purpose of this paper is not to validate any accuracies of digital art's nomenclature, nor to try to derive an ultimate definition of digital art. Rather, through an analysis of literature, the goal of this paper is to gain an understanding of Taiwan's proposition on art forms which utilize technology as a medium, and derive a categorized framework for digital art that will form the foundation for this exhibition.

In Taiwan, the following Chinese terms are often used: "technology art (Ke Ji Yi Shu)," "computer art (Dian Nao Yi Shu)," "new media art (Shin Mei Ti Yi Shu)," and "digital art (Shu Wei Yi Shu)." (Table 1) However, international scholars also use other nomenclatures besides the ones mentioned above. For example, Oliver Grau and Frank Popper use the term, "virtual art," to emphasize the virtual aspects of digital art. This also highlights the immersive and realistic experiences of interaction within virtual realms.[1] Stephen Wilson used the term, "Information Art," to define cross disciplinary creative works that merge art with technology, science, and other areas. This term emphasizes his statement that "we increasingly live in an 'information society' where the creation, movement, and analysis of ideas is the center of cultural and economic life. In our culture, scientific and technological information is the critical core of that information." (Wilson, 2002)

In the development of Western digital art, "computer art" laid the foundations starting from the 50s and 60s, featuring images that were created by computer algorithms. Nowadays, numerous types of computer programs are available, resulting in a greater scope of digital art that encompasses 2D and 3D images, animations, as well as other multimedia forms. The use of the terms, "technology art" and "art and technology," can be traced back to 1966 when Billy Kluver and Robert Rauschenberg formed "Experiments in Art and Technology (E.A.T.)," an organization established to foster collaboration between artists and engineers. They used "Technology" and "Art" in the group's name to emphasize the merging of art and technology. In Robert Atkins' 1990 book, Art Speak, Atkins also used the terms, "Art and Technology" and "High-Tech Art," to define artistic works that use technology as a creative medium. (Atkins, 1990)

In 1977, due to Yuyu Yang's influence, the first "Laser Promotion Association" meeting was held in Taiwan, which sought to bring laser art and technology to Taiwan. However, this did not create much of an impact. In 1988, one of National Taiwan Museum of Fine Arts' first exhibitions was "High Technology Art," which featured Light Art, Kinetic Art, Video Art, Laser Art, Computer Graphics and Fine Arts, and Cyborg Art. (National Taiwan Museum of Fine Arts, 1988)

In 1990, Peisuei Lee returned from her studies in Japan, and hosted the exhibition, "Computer Art," thus, coining the term "computer art." Two years later in 1992, Lee published the book, Computer Art, a compilation of her and Yoichiro Kawaguchi's computer artwork, "Fractal." From this, "any new concept or unique aesthetic that is expressed with the use of computer technologies is considered computer art." (Yoichiro Kawaguchi, Peisuei Lee, 1992) In the same year, Loh Li- chen returned from New York and published the article, "A Dialog Between the Computer and Art," which introduced mostly American computer artworks. At the beginning of this article, she defined "computer art" as "pure art created by the computer." For the "The Second Emerging Expression Biennial," Loh used Patric D. Prince's perspective as her main focus. The works introduced three forms of computer art: "works that are created or expressed with traditional mediums, but aided by computers in the creation stages, such as during the design, outlining, or modeling processes"; "[2]works that use the computer as the medium, where they are displayed on a monitor or manipulated by peripheral devices;" "works that use computers as an inspiration in the field of visual research: artists probe the effects of technology on the human condition, as well as explore the relationship between the computer and people." (Li-Chen Loh Sappho, 1993) From Sappho's perspective, the computer is not only a visual tool in the field of computer art, it also breaks the stereotype and misconception that "computer art" is computer graphics.

The term, technology art (Ke Ji Yi Shu), can be traced back to 1993, when Su Shou Cheng (Director of the Center for Art and Technology at Taipei National University of the Arts from 1992-98) actively promoted the formation of TNUA's Center for Art and Technology.   With the official establishment of the Graduate School of Arts & Technology[3] in 2001, the term, "computer art," was gradually replaced with "technology

---

1   Oliver Grau shows how virtual art fits into the art history of illusion and immersion. (Grau, 2003) Frank Popper emphasizes virtual realms created by the application of technology, while focusing on the illusions created within "light's" interface and its importance within digital art. (Popper, 2007)

2   The author uses New York artist Kathleen H. Ruiz's work, "Repository Construct", to explain a type of computer art. After creating a draft with the computer program, Ruiz pre-processes the computer generated image on to papyrus paper, referring to Loh Li-Chen. (1993,5.1). Computer and Art's Dialog. *Art Monthly*, 41, 68-71.

3   In 2010, the Graduate School of Arts & Technology became the Department of New Media Art, which included both an undergraduate and graduate program.

art." In 2002, Yageo·Foundation, together with the Asian Cultural Council, established the Yageo Tech-Art Award. Later in 2006, Hong-Gah Museum along with the National Culture and Arts Foundation proposed the "Techno Art Creation Project," which would help to support technology artists with their creative career. The award would cover digital image artworks, interactive installations, video artworks, Internet art, sound art, etc...7 In 2003, Taipei Fine Arts Museum hosted the exhibtion, "Streams of Encounter-Electronic Media Based Artworks." During the exhibition, German curator, Andreas Walther, clarified the scope of "technology art" in his statement: "For 'Streams of Encounter,' all artworks that are created by mechanical or electronic devices, based on electronics, or use electronic mediums." (Walthers, 2003) The exhibition mostly featured photographic and video art forms, but also included mechanical/electronic and sound installations, which redefined technology art in the public eye.[4]

Simultaneously, new media art, a term inherited from media art, emphasizes the use and experimentation of "new technology" to make it a possible artistic expression. Chia-Chi Wang (2004) defined "new media art" as an extension of or a more in-depth look into "media art," with an emphasis on the use of digital video, the Internet, interactive media technology, and the special media characteristics of art. In 2006, Taipei Fine Arts Museum exhibited a Centre Pompidou collection of 33 videos, films, and video installations and named this exhibition, "Pompidou: New Media Art." Based on Lev Manovitch's theory on new media art, Christine Van Assche made the following

Tseng Yu-Chuan (SoiiZen) Who-shadow
Interactive Installation 2008
Beyond a Dialloge- the 3rd NCAF Techno Art Creation Project in National Taiwan Museum of Fine Arts。

definition: "New media works must all be created by using digitally specified equipment (e.g. works made through video and audio tapes, CDs, hard drives, the Internet), but also include traditional media, which due to presentation necessities, are transcribed into digital formats (e.g. movies)." (Christine Van Assche, 2006) And, in 2007, Taipei National University of the Arts, National Taiwan University of Arts, Tainan National

4 Within Walther's essay, he discusses the ambiguity of the term, "Media Art." According to him, "it creates associations with strict concepts of Futurism, which is a severing of all tradition within a cultural context." Therefore, he refuses to use the term, "Media Art." (Walther, 2003)

University of the Arts, and The Australian National University's Centre for New Media Arts co-hosted, "Boom! An Interplay of Fast and Frozen Permutation in New Media - Taiwan-Australia New Media Arts Exhibition." There, Yung-Hsien Chen wrote that, "The Australian government....is even more committed now to the development and integration of the new media art industry in digital movies, videos, computer animations, interactive media, user interfaces, virtual reality, computer games, and digital content..." (Yung-Hsien Chen, 2007) This exhibition believed that new media art extended to cover computer games and the digital content industry, echoing the official definition of the term, "digital art."

Taiwan began to use the term, "digital art," in the year 2000, when the Acer Foundation established the "Acer Digital Arts Center." The same year, they organized the "International Digital Art Millennium" exhibition, and published the book, Digital Art: Europe: Sampling Report of Austria, Germany, and Holland. As a result, the term, "digital art," gradually became used. Its various forms of "technology art," "media art," and "new media art" each have their own followers and supporters.

In 2001, Li Chiou Chen defined "digital art" as "artworks produced through a process of digital methods and means, thereby known as 'digital art.'" (Li Chiou Chen, 2001). This definition has been used widely by students. In 2002, the Council for Cultural Affairs also adopted a broad definition of digital art, stating

Tseng Yu-Chuan, Jason Lee
Flow, Web Interactive Installation, 2006
Boom! An Interplay of Fast and Frozen Permutation in New Media in Taipei National University of Arts, Kuando Museum of Arts, Taipei County.

that it is the integration of various creative forms made through digital expressions, such as digital music, interactive installations, digital images (CG), digital animation, film and Internet creations. In 2005, Chin-Juz Yeh published, Introduction to Digital Art, referring to "digital art" as including computer art, Internet art, digital photography, dynamic video art, software art, new media art, and other various expressive forms. He explained, "Modern computer equipment is based on digital technology. Simultaneously, the concept of "digitalization" also has an absolute influence on the direction and character for artworks. Therefore, in art-related discourse, the general term of "digital art" is used to replace the term "computer art," including all of its collective parts and emphasizing that "digital art is not a particular style or philosophy, rather it's closer to names such as oil painting, wood carving, or photography which specify the tools or presentation methods of the artwork..." (Chin-Juz Yeh, 2003)

"Computer art," "digital art," and "new media art" emphasize the object traits of creative expression produced through technological tools and media. Therefore, in this framework, according to the technological characteristics of media and medium, its proposition theme falls under the focus of three types of terms. The official definition of "digital art" is biased in favor of the digital creation industry, hoping to enhance the value of the digital content industry and its competitiveness. Li-Chiu Chen and Chin-Juz Yeh use the "tool" perspective to explain "digital art," resulting in many people viewing "technology art," "computer art," "media art," and "new media art" to be relatively similar. In the general definition, the main direction relies on computer tools, emphasizing the application of technology and using it as a definition for a type of media tool.

NAVIGATOR - Digital Art in the Making, National Taiwan Museum of Fine Arts

To define "digital art," one must start with the definitions for "digital" and "technology." The word, "digital," describes technology that generates, processes, and stores data in a positive and non-positive state. Data is converted into string combinations of 0s and 1s, with each number called a bit, or binary digit. A byte is composed of a number of bit strings and used as a unit to handle binary characters. (Halnon, 2002) Negroponte describes bits as similar to DNA in a human body. They are the smallest element of information. Even though they do not have color, size, or weight, they are in a state of existence. (Negroponte, 1995) Therefore, the meaning of digital is not only limited to technological definitions, but also extend to the limitless boundaries of data structures that comprise all of existence.

Therefore, according to Heidegger's the instrumental definition of technology, and the essence of technology (Hsu Liang, 2005), the implementation, evolution, and emergence of technological tools will allow one to re-understand the state of technology's existence. By using technology to re-familiarize oneself with the obscured truth about the nature of phemoma, as well as conducting a "nature analysis" to understand the relationship among technology, people, and the world, a clearer understanding about how our technology-shaped world manifests itself is gained. Only then, one can comprehend the true nature of modern technology. (Hsiu Liang, 2005)

Under this concept, the proposed definition for "digital art" should cover the creative expressions created by digital technology tools. This concept should also explore the living conditions and the existence it transpired within this world built by technology, which are topics that can be incorporated into discussions relating to digital art.

The nature of technology is not just limited to the utilization of tools and the final result of those processes. It also emphasizes the understanding of the changing relationship between human technologically civilizations and the human condition through use of technological tools. (Li Ming Feng, 2003) Digital tools have brought on a digital revolution and constructed a new world made of bits. They have changed the economic model for the entire information society; the "bit" has become the basis for systematic thought. Digital technology has not only arisen as the dominant tool for creating art, more importantly, it has impacted the pulse of progress for the whole of society, culture, and life, as well as the thought models and creative topics for artists.

Just as Christiane Paul believes, perhaps definition and classification can help clarify the unique characteristics of such an art media. But, the limitations of definition might also hinder the understanding of new possibilities for an art form, especially when it is in such a constantly evolving state. (Paul, 2003) Due to constraints of space, this paper cannot delve into a dialectical analysis. However, the motive for this definition is to clarify the reasoning behind the nature of this art form, and to only define digital art history for the purposes of this exhibition.

Year	Organization	Chinese	English
1988	Taiwan Museum of Art	尖端科技藝術展	High Technology Art
1988	Taiwan Museum of Art	日本尖端科技藝術展	Japan High Technology Art Exhibition
1990	Taipei Fine Arts Museum	李佩穗「電腦藝術展」	Computer Art
1992	Taipei National University of the Arts	科技藝術中心	Center for Art and Technology
1999	Acer Foundation	宏碁數位藝術中心	Acer Digital Arts Center
2000	Acer Digital Art Center	國際數位藝術紀	ArtFuture 2000
2001	Taipei National University of the Arts	科技藝術研究所 2010 年更名為新媒體藝術學系	Graduate School of Arts & Technology
2002	YAGEO Foundation	國巨科技藝術創作獎	Yageo Tech-Art Award
2003	Taipei Fine Arts Museum	靈光流匯 - 科技藝術展	Streams of Encounter-electronic media based artworks
2004	YAGEO Foundation	國巨科技藝術國際學術研討會	Yageo Techart International Symposium

2005 ～	Hong-Gah Museum & National Culture and Arts Foundation	「科技藝術創作發表專案」補助計畫	Techno Art Creation Project
2004	Museum of Contemporary Art Taipei	數位城市・媒體昇華──新媒體藝術展	Digital Sublime
2004	National Taiwan Museum of Fine Arts	漫遊者 -2004 國際數位藝術大展	NAVIGATOR - Digital Art in the Making
2004	National Taiwan Museum of Fine Arts	台灣數位藝術知識與創作流通平台	Taiwan Digital Art and Information Center
2005	National Taiwan Museum of Fine Arts	快感—奧地利電子藝術節 25 年大展	Climas-The Highlight of Ars Electronica
2006	Taipei Fine Arts Museum	龐畢度中心 新媒體藝術	New Media Collection 1965-2005 Centre Pompidou
2007	National Taiwan Museum of Fine Arts	數位方舟	Digial Arts Creativity and Resource Center
2007	Taipei National University of the Arts, National Taiwan University of Arts, Tainan National University of the Arts, Australia National University - The Centre for New Media Arts	Boom！快速與凝結新媒體的交互作用－臺澳新媒體藝術展	Boom! An Interplay of Fast and Frozen Permutation in New Media
2006~	Taipei City Department of Cultural Affairs	台北國際數位藝術節	Digital Art Festival Taipei
2009~	Taipei City Department of Cultural Affairs	台北數位藝術中心	Digital Art Center, Taipei

Table I: The terms used by major exhibitions or organizations in Taiwan

References

Atkins, R. (1990). *ArtSpeak : a guide to contemporary ideas, movements, and buzzwords*. New York: Abbeville Press Publishers.

Grau, O. (2003). *Virtual art : from illusion to immersion* (Rev. and expanded ed.). Cambridge, Mass.: MIT Press.

Halnon, M. (2002). *2002 Digital Dictionary*. Retrieved Nov.19, 2008, from www.netaonline.org/pd-digitalglossary.rtf

Paul, C. (2003). *Digital art*. London ; New York: Thames & Hudson.

Popper, F. (2007). *From technological to virtual art*. Cambridge, Mass.: MIT Press.

Wilson, S. (2002). *Information arts : intersections of art, science, and technology*. Cambridge, Mass.: MIT Press.

Wan C-C(2004). Discourse of Taiwan's media arts development. *Navigator—Digital Art in he Making International Conference*. Taiwan Musuem of Art (Ed.)(1988) Taichung: Taiwan Musuem of Art.

Negroponte (1995). *Digital Revolution*. (Chinese version.).Taipei: Commonwealth Publishing.

Christine Van Assche (2006).New media art history and museology.In C.Y. Chien, Y.Q. Lien , Y. Y. Chen(Ed.). *New media collecttion 1965-2005 Centre Pompidou*. (pp. 16-37).Taipei: Artouch Press.

Yoichiro Kawaguchi, Lee Peisuei(1992). *computer Art*. Taipei: Art Books.

Liang, Hsu (2005). *Philosophy of Technology*(1ed.). Shanghai: Fudan University Press.

CHEN, Y-H(2007). New media arts development in Taiwan & Australia. In Shih C-J., Lin P-C.(Ed.). *Boom! An Interplay of Fast and Frozen Permutation in New Media*. (1 ed., pp. 31-33).Taipei: National Taiwan University of Arts.

Chen L-C(2001, 11). On the modernization of Taiwan's art education from the global trend of digital art. *Information Technology and Arts Education Practice Conference Proceedings*. Taoyuan.

Andreas Walther(2003). Streams of Encounter. In Chang F-W. (Ed.). *Streams of Encounter-electronic media based artworks*. (pp. 10-13). Taipei: Taipei Fine Arts Museum.

Feng, L-M (2003). *Modern art in the context of Technological civilization*. Beijing: China Social Sciences Press.

Yeh C-J (2003). *Art Language Digital Era*. Taipei: Arttouch Press.

Loh L-C(1993, 5.1). Computer and Art's Dialog. *Art Month*(41, 68-71).Taipei: Art Month Press.

脈 - 台灣數位藝術河流

執行統籌　曾鈺涓
資料彙整　曾鈺涓　駱麗真
裝置設計　陳威廷　范聖佑 (得寬科技) 洪于潔
互動程式　陳泊任 (玩創互動)　葉志豪（玩創互動）
音效創作　鄭學侖 Allen CHENG (得寬科技)

　　「台灣數位藝術脈流計畫」試圖透過歷史資料的建立、研究論述的彙整，提出一個具史觀與脈絡的展覽架構。以駱麗真所整理的新媒體藝術史為基礎，提出「台灣數位藝術史」年表，並以「脈 - 台灣數位藝術河流」數位互動創作呈現台灣數位藝術發展。此年表雖未臻完善，但期盼參與者可以透過視覺與互動，一起來感受台灣數位藝術史的發展脈動。

Pulse-Taiwan Digital Art River

Producer　　TSENG Yu-Chuan
Content　　TSENG Yu-Chuan　LOH Li-Chen
Design　　CHEN Wei-Ting　FAN Sheng-You/ the QWAN Technolgy　HUNG Yu-Chieh
Program　　Jack CHEN/Daniel YEH/ gotoAndPlay( ) Digital Consulting
Sound　　Allen CHENG/ the QWAN Technolgy

　　Through compilation of historical data and literature research, the goal of the "Taiwan Digital Art Pulse Stream Plan" is to establish a formal history of Taiwanese digital art's development. Based on Loh Li-Chen's compilation of the history of new media art as its foundation to reveal a timeline of the "Taiwan's digital art history." Although the chronology is not complete yet, but, viewers are invited to experience the development of Taiwan's digital art scene throughout its history via a timeline in the form of a digitally interactive installation, "Pulse-Taiwan Digital Art River."
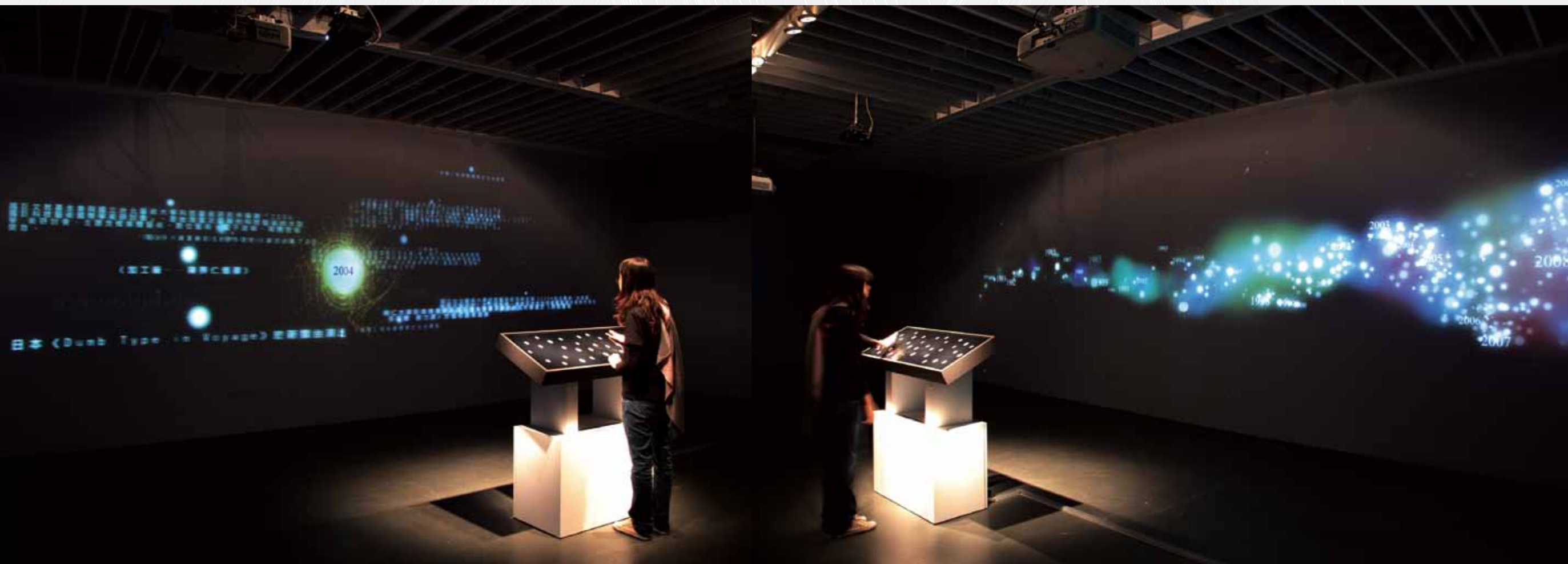
台灣數位藝術脈流計畫－脈波壹
「身體‧性別‧科技」數位藝術展

展覽資訊

展覽日期： 2010/12/17(五)~2011/01/23(日)

展覽地點：台北數位藝術中心。台北市士林區福華路 180 號

指導贊助：文建會

贊助單位：台北市文化局

主辦單位：台灣科技藝術教育協會

共同主辦：財團法人數位藝術基金會

協辦單位：社團法人中華民國視覺藝術協會、台灣女性藝術協會

發行人 : 廖偉民

策展團隊：林珮淳、廖新田、陳明惠、邱誌勇、駱麗真、曾鈺涓

參展藝術家：宇中怡、沈聖博、林珮淳、郭慧禪、陳威廷、黃博志、黃建樺、黃怡靜、張惠蘭

曾鈺涓、葉謹睿、蔡海如、劉世芬、駱麗真 (依姓氏筆劃排列)

展覽統籌：曾鈺涓

展覽執行：胡財銘

展場設計：陳威廷

攝影記錄：胡財銘

錄像記錄：張家維

視覺設計：曾鈺涓

網站設計：范聖佑

專輯執行小組

專輯主編：曾鈺涓

執行編輯：曾鈺涓

文字翻譯：黎思庸

美術設計：曾鈺涓

出版單位：台灣科技藝術教育協會

地址：新竹市明湖路 648 巷 102 弄 32 號

出版日期：中華民國 99 年 12 月 初版

© 2010 台灣科技藝術教育協會 版權所有

作品圖錄版權數藝術家所有

Taiwan Digital Art Pulse Stream Plan: The First Phase
「Body、Gender、Technology」Digital Art Exhibition

Exhibition Information

Date：2010/12/17(Friday)~2011/01/23(Sunday)

Location: Digital Art Center, Taipei , (No.180, Fuhua Rd., Shihlin Dist., Taipei 111, Taiwan)

Supervisor Sponsored by Council for Cultural Affairs

Sponsored by Taipei, Department of Cultural Affairs

Organized by Taiwan Information Design, Art, Technology, Education Association

Co-organized by Digital Art Foundation

Supported by Association of the Visual Arts in Taiwan, Taiwan Woman's Art Association

Publisher: LIAO Wei Ming

Curatorial Team：LIN Pey Chwen・LIAO Hsin-Tien・Ming TURNER・CHIU Chih-Yung・
LOH Li-Chen・TSENG Yu-Chuan

Artists：YU Chung- I ・SHEN Sheng-Po・LIN Pey Chwen・KUO Hui-Chan・CHEN Wei-Ting
HUANG Po-Chih・HUANG Chien-Hua・HUANG Yi-Ching・CHANG Hwei-Lan・TSENG Yu-
Chuan ・YEH Chin-Juz ・TSAI Hai-Ru・LIU Shin-Fen ・LOH Li-Chen

Exhibition Director：TSENG Yu-Chuan

Exhibitio Assistants：HU Tsai-ming

Exhibition Architecture：CHEN Wei-Ting

Photo: HU Tsai-ming

Video: Chang Cha-Wei

Visual Design：TSENG Yu-Chuan

Web Site Design：FAN Sheng-You

Catalogue Team

Chief Editor：TSENG Yu-Chuan

Executive Editor：TSENG Yu-Chuan

Translator：LAI Sijung

Visual Design：TSENG Yu-Chuan

Publisher：Taiwan Information Design, Art, Technology, Education Association

Address：No.32, Aly. 102, Ln. 648, Minghu Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)

Publishing Date：December, 2010, first edition

© 2010 Taiwan Information Design, Art, Technology, Education Association   All Rights Reserved