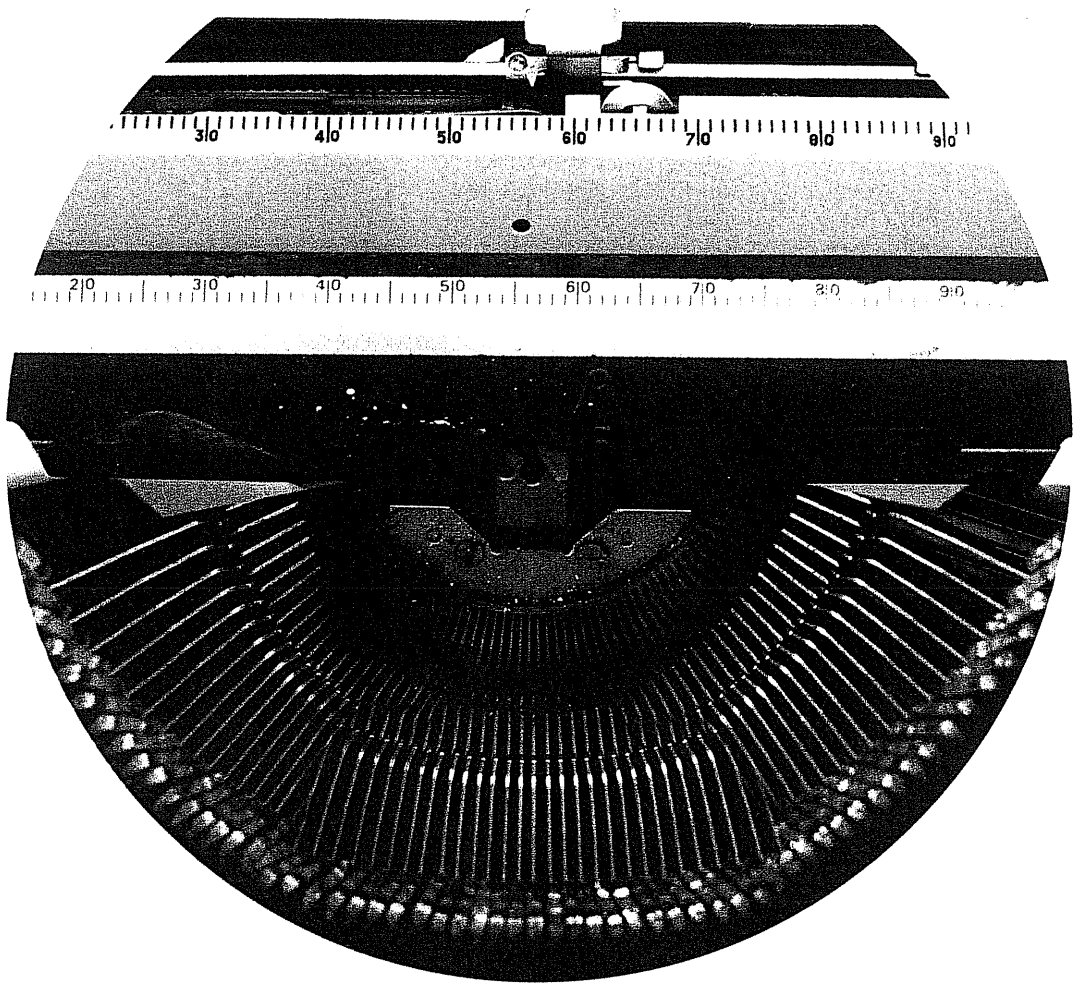

WRITING MACHINE COLLECTIVE EDITION 4

2 0 1 1

Computational Thinking In Existing Art Forms

Writing Machine Collective Edition 4

Date: 14-30th January, 2011
Venue: Youth Square, Chai Wan
Opening Hours: 10:00 – 22:00

Website: www.writingmachine-collective.net

藝術創作中的運算式思維

文字機器創作集第四輯

日期：2011年1月14日至30日
地點：柴灣青年廣場
開放時間：10:00 – 22:00

Co-presented by: WRITING MACHINE COLLECTIVE 文字機器創作集

青年廣場 Youth Square

Supported by: 香港藝術發展局 Hong Kong Arts Development Council

Equipment Sponsor: EPSON EXCEED YOUR VISION SAMSUNG

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DATE	TIME		TARGET	VENUE
22 JAN	10:00 - 12:00	**Workshop 工作坊** 'Chinese Ideogram and Animated Word-pictures' 意像圖與"字" "動"圖 *Daniel Chong 莊德華先生*	Primary school students (Quota 20) 小學生 (名額 20)	Video Shooting Studio,2M/F 2M樓 錄影室
	12:00 - 13:00	**Guided Tour 導賞團**	ALL (Quota 20) 各年齡人士 (名額 20)	Y-Studio Y 劇場
	14:00 - 15:30	**Lectures 講座** Lecture 1 : 'Cinema, Gesture, Computation' 講 座 1 : 電影、姿勢、計算 (英語) *Dr. Hector Rodriguez 羅海德博士* Lecture 2 : 'Cognition, Computation, and Creativity' 講 座 2 : 認知、計算、創意 *Dr. Kenny Chow 周嘉年博士*	Higher Education students 大專或以上學生	
	16:00 - 17:00	**Guided Tour 導賞團**	ALL (Quota 20) 各年齡人士 (名額 20)	
	17:30 - 18:30	**Screening I 短片播放 I**	ALL 各年齡人士	Y-Studio Y 劇場
23 JAN	14:00 - 15:30	**Screening II 短片播放 II**	ALL 各年齡人士	Y-Studio Y 劇場
	16:00 - 18:00	**Workshop 工作坊** 'Generative Illustration' 衍生漫畫 *Justin Wong 黃照達先生*	ALL (Quota 20) 各年齡人士 (名額 20)	Video Shooting Studio,2M/F 2M樓 錄影室
29 JAN	10:00 - 12:00	**Workshop 工作坊** 'Chinese Ideogram and Animated Word-pictures' 意像圖與"字" "動"圖 *Daniel Chong 莊德華先生*	Primary school students (Quota 20) 小學生 (名額 20)	Video Shooting Studio,2M/F 2M樓 錄影室
	12:00 - 13:00	**Guided Tour 導賞團**	ALL (Quota 20) 各年齡人士 (名額 20)	
	14:00 - 16:00	**Workshop 工作坊** (game session with discussion): 'Generative Thinking in Contemporary Art and Creative Writing' 衍生性思考:當代藝術與創意寫作中的軌跡 *Dr. Linda C.H. Lai 黎肖嫻博士*	ALL (Quota 40) 各年齡人士 (名額 40)	Video Shooting Studio,2M/F 2M樓 錄影室
	16:00 - 17:00	**Guided Tour 導賞團**	ALL (Quota 20) 各年齡人士 (名額 20)	
30 JAN	14:00 - 15:30	**Lecture/ Workshop 工作坊** *Professor Mary Flanagan*	Higher Education students (Quota 50) 大專或以上學生 (名額 50)	Video Shooting Studio,2M/F 2M樓 錄影室
	16:00 - 18:30	**Artists' forum + Guided Tour 講座 + 導賞團** *All Artists 所有參展藝術家*	ALL (Quota 50) 各年齡人士 (名額 50)	

從書寫球到文字機器

／何禹旂

1865年, 丹麥發明家拉斯穆斯. 漢森 (Rasmus Malling-Hansen) 發明了世界上第一部公開發售的打字機器－漢森書寫球 (Hansen Writing Ball)。它比我們熟悉的盒形打字機要早兩年面世, 可是, 書寫球的壽命只維持了約半個世紀。到了二十世紀初, 書寫球已經絕跡於桌上, 而肖爾斯(Sholes)發明的盒形打字機則成為所有辦公室的配備。如今, 打字機也成為了過時的機器, 但它的文字輸入設計(即鍵盤)卻成為之後語言處理科技的規範。甚至令人難以想像除一塊佈滿字母的平面外, 世上還存在其他用手鍵入文字的可能。而確實存在過的書寫球卻告訴我們, 書寫科技可能發展出的另一個平衡宇宙。

書寫球把字母鍵佈置在一個半圓形金屬球體之上, 而紙張則置於球形鍵盤下的圓筒表面, 隨著使用者換行, 圓筒便由一邊慢慢轉向另一面。書寫球為我們提供一種與打字機截然不同的寫作經驗:單手書寫, 而且因為紙張被鍵盤完全覆蓋, 打字時無法看到自己的文字。事實上, 書寫球設計的其中一個目的便是針對盲人的需要:圓拱形鍵盤讓每個字母鍵擁有獨特的弧度與立體空間位置, 相反, 打字機的平面鍵盤卻欠缺空間感讓失明人士確認每個字母的所在。

漢森不單是一位發明家, 他同時是丹麥皇家聾啞學院(Royal Institute for the Deaf)的校長, 長期關注改善殘障人仕教育的方法, 並從聾啞學生的手語之中得到發明書寫球的靈感。或許因此, 漢森的發明比打字機更著重於空間與書寫的連繫, 有別於打字機建立於視覺上的操作。

打字機所確立的「視覺－書寫」關係成為之後文字科技的主流, 從最初只是看到自己剛打出的句子, 到現在眼前的二十多吋LCD螢幕, 可以同時容納大量和這篇文章有關的資料供我參考。而「視覺－書寫」科技的驚人發展, 難免令人想到, 如果當初勝出的是書寫球而不是打字機, 那麼我們會活在一個怎樣的「空間－書寫」科技世界。

在今次的《文字機器創作集第四輯》中, 每位藝術家的創作正是要思量書寫和各種媒體與知覺的可能性, 與及以機器作為寫作的邏輯而非輔助工具的結果。機器不單是手指的延伸, 當被賦予算式與規則後, 機器便擔當著作者的身份, 衍生出超越始作俑者－藝術家自身的產物。運算結果既可以保留文字的面目, 亦可以透過影像以至空間的光度表達, 更甚者, 機器也可以成為編輯的角色, 倒過來要人類去解讀它們, 由觀眾完成最後的文字化部份。

機器與人腦未必是單純的勞動與創作分工關係, 打從第一日起文字機器便和人類成為合作伙伴, 有時又或者成為創作的來源。1882 年, 尼采(Nietzsche)向漢森購入了他的書寫球, 卻因為運送不慎受損而無法正常操作, 對著這個殘廢鐵球的他於是寫了一首詩:

The Writing Ball is a thing like me: of iron
Yet twisted easily – especially on journeys.
Patience and tact must be had in abundance
As well as fine [little] fingers to use us.

From Writing Ball to Writing Machine

/ *HO Yue-jin*

[English abstract by Linda Lai]

In early 20th century, the Hansen Writing Ball, invented for general use since 1865 by Rasmus Malling-Hansen, finally lost its popularity to Sholes' box-shape writing machine, or what came to be known as the typewriter. It was no pure commercial battle. Sholes' typewriter in a way re-defined writing by establishing an instantaneous seeing-upon-writing mode, which remains dominant in today's LCD-screen culture. The visual orientation of writing in Sholes' machine stood in contrast with the Hansen Writing Ball, which, designed with people of hearing and speech disability in mind, spatially separated typing on paper and reading of the typed text into two isolated steps. Imagine the Hansen Writing Ball had remained dominant, or suppose the writing ball and the type-writer had equally significant parallel development – what would our writing experience have become? Not seeing immediately what one has written could be fascinating.

Almost all works in the current WMC_e4 are concerned with the question of mediated perception in writing activities due to the presence of tools, as much as how machine processes produce new forms of writing logic. Machines are not only the extension of the human hands that write; they endow our hands with rules, procedures and algorithms. Machines are the place-holder of authorship and author's identity. What is generated by machines, however, exceeds the initiator-artist's design. Some of the WMC_e4 artists seek to re-produce the machine process, while others translate the outcome of machine work into a different medium, or via spatialization. And yet some machines are editors, inviting decoding and interpretation.

'Writing': its support, affordance, and computational thinking

/ *Linda C.H. LAI*

Computational thinking...

On Thursday, December 16, 2010, "without much fanfare, Google made a mammoth database culled from nearly 5.2 million digitized books available to the public...for free downloads and online searches, opening a new landscape of possibilities for research and education in the humanities." (*International Herald Tribune*, December 17, 2010, lower front page) As new media theorist Janet Murray suggests, a turning point in the closing of the gap between computation as a science and computation as a human reality lied in the need to archive and retrieve bulk information as it grew in boundless quantity especially in times of war in the first half of the 20th century. The Google story of 2010 then seems no particular wonder except that storing and retrieving huge amount of data is no longer just a projected reality. Or perhaps more than that: the 2 centuries of works Google puts on the web should present to the everyday person new challenges in forming views about human existence. Consider the infinite number of search and the scope covered via a 5-word string. Consider the fact that meta-knowledge, as well as the constructed-ness of knowledge, is now a necessary object of learning: with a click, one "can instantly see how 'women' are rarely mentioned in comparison to 'men' until about 1970," and cultural trends in history is something even an 8-eight-year child can acquire in a browse. Consider the 500 billion words "contained in books published from 1800 to 2000 in English, French, Spanish, German, Chinese, Russian and Hebrew" available at one's disposal. And this takes me back to the WMC_e4, to computational thinking in art and for the everyday person in multifarious manifestations.

Ask Umberto Eco, or Raymond Queneau: how many possible sentences, poems, books and volumes can one produce with an archive of 500 billion words, based on permutation and combinatorial principles? The answer is 'infinitive' – but that is not a very interesting answer. Fascination comes in what happens to every single moment of writing against the backdrop of infinite possibilities and immense amount of raw material at hand. What Gerard Genette called intertextuality, architextuality and hypertextuality are the main attributes of any textual activity. Between the occurrence of a thought to be written down and the final pinning down as a piece of work lies the drama of computational thinking.

According to the mission statements of Centre for Computational Thinking at Carnegie Mellon University (CMU), computational thinking is primarily "a way of solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science," and yet it is also "a fundamental part of the way people think and understand the world." Computational thinking has three core features: first, creating and working with levels of abstraction; second, thinking algorithmically, which highlights methods of induction; and third, working with the awareness of the significance of scaling. (**"http://www.cs.cmu.edu/~CompThink/"**) CMU Professor Jeannette M. Wing's grand vision is that "computational thinking will be a fundamental skill used by everyone in the world by the middle of the 21st century – just like reading, writing, and arithmetic," and something to add to every child's analytical ability. In her manifesto of computational thinking, computer science is not just computer programming. Computational thinking emphasizes conceptualizing, not programming.

'Writing' computational thinking...

Writing as explored in the previous three WMC exhibitions has underlined computational thinking. Writing in our projects refers to all activities that turn isolated units into systems. The performative side of writing is the very process and the activities of making connections and forming relations; whereas writings as a material formation point to a writing event's life-span of amazement – the leap from the original raw material to the final work of complexity with a totally different, often unpredictable, look. As Jeannette M. Wing says, in computational thinking, it is ideas, not artifacts, which matters. So is writing to the WMC, as the enactment of computational thinking.

So much has been said about the importance of the cognitive texture of writing. Taking stock of the variety of works presented in previous and current WMC showcases, I notice that writing has always been understood as part of a total event. In his book *Paper Machine*, Jacques Derrida points out the importance of making distinctions among book, writing, modes of inscription, production, reproduction, the work, its workings, market economy, publishing laws and so on – in the long run in order that we can look at all of these concepts as a totality. Derrida considers the book and its support. By extension, we may also consider writing and its support. Derrida distinguishes between the book as a concept (in the literary sense) and the book as a physical entity (in the literal sense of the term), between book as a form and a model, and book as a work. We think of writing as the inscription of ideas, we also think of writing in relation to its inscription technology. Writing requires a place-holder: in pre-digital days, paper is that place-holder, whereby writing acquires its identity. Then the book: according to Derrida, the book is writing on material forms such as paper, combined definitively to highlight identified authorship and prevent any tempering of the content by the readers. What about the digital platform and other new place-holders? How has the materiality of the different inscription technologies define the attributes of writing? What should we make of Google as a new place-holder, as well as a substitute place-holder for all existing place-holders?

Performing computational thinking in WMC_e4: the works...

Many of the WMC works have set out to move beyond the semantic aspects of writing to address the above issues. **The present continuous tense of writing** is a shared feature among all works. Highlighting the continuous, **performative process of writing** is also to open the possibilities of intervention, interruption, re-writing, and thus highlighting the precarious and contingent state of interpretation.

Writing as a performance is most explict in Yue-jin Ho and Iras Tam's *Mouse-click Notation*, a piece of micro-writing that is the sonification of mouse activities.
Permutation as a mode of computational thinking is explored in Justin Wong's generative comics, *City Forum*, which may churn out potentially infinite animated comic narratives based on a library of graphic prototypes archived across the time-span of 3 years. Zoie So's sculpture (*Mediated Facial*) and Linda Lai and Gary Ng's dispersed installation (*Scriptorium*) both concern with **connectivity and procedures**, highlighting computational thinking's **algorithmic nature**.

The writng process as intermedia translation subverting semantics-based encoding-decoding is explored in the works of Told To, Enrica Ho, and Vasco Paiva. Whereas To (*Visual Diary Generator*) turns image into text, Ho (*Le montage de l'émotion*) desires meaning-laden text to relax to become visual prints of pure color sensations. Paiva (*Sea of Mountains*) calculates pixel values in a video clip and turns them into a sound score.

Winnie Soon + Helen Pritchard's *jsut code* and Mary Flanagan's *[borders]* engage with computing as **social media and on-line communities**. While Soon and Pritchard playfully and industriously **encode, decode and re-code** messages on Twitter to subvert and stretch the limits of 'meaningful' messges, Flanagan indulges visitors in the virtual world of apparently boundless drifting as far as code-writing and algorithmic rendering allows.

A few artists in WMC_e4 focus their effort in revealing the **linguistic nature embedded in the architecture of the**

computer, especially Hector Rodriguez (*Gestus*), Kenny Chow and D. Fox Harrell (*Coding Landscape, Crossing Metaphors*), and Ip Yuk-yiu (*abbreviated Double Indemnity*).

Taking another perspective, more than a few works announce **new species of cinema**, and playfully fill the screen with new writing material, overcoming the hegemony of mainstream narrative cinema. "Twenty-is-one-is-twenty" could be a way to describe the multi-window found-footage work of Rodriguez's *Gestus*. Chow and Harrell's highly pictorial *Coding Landscape* invites visitors' fingers to contribute to the work the missing protagonists of a landscape excursion. Ip's *Double Indemnity*, using one mainstream Hollywood genre film as its raw material, allows the 'back kitchen' of the celluloid construct of the movie to take over the screen space. Lai's *Scriptorium* is a tongue-in-cheek enquiry of where visible material on a screen comes from, and if anything that moves qualifies for moving image. Wong's *City Forum* proclaims itself generative cinema, exploring the infinite internal self-multiplication of a fixed library of visual images. All of these works in one way or other build upon the notion of **archive, library and database**, presumed features of computation.

The **critique of culture** is the explicit objective of the many 'writing' exercises in this exhibition. In addition to Rodriguez's critique of mainstream narrative cinema, Justin Wong's work is primarily caricature of local politics and social scandals. Ho and Tam's *Mouse-click notion,* originally titled 'two-word poem', pays tribute to the forgotten laborers of ancient China, the evidence of whose existence survives only in the inexpressive utterance of the 2-word poems. Linda Lai's *Scriptorium* directly addresses de-humanization in assembly lines and, in response, re-creates the assembly-line experience with computational authorship, re-defining productivity as personal engagement.

Macro Objectives...

As we arrive here in the WMC_e4, we find ourselves negotiating our artistic creation within a trajectory of contrastive positions:

At one end of the trajectory, we have Prof. Wing's manifesto of computational thinking: computer science is not just computer programming; computational thinking honors conceptualizing, not programming.

At the other end of the trajectory, there is the imperative to work with code-writing as a unique artistic medium. American artist Golan Levin upholds the necessity for an artist to grapple with its own programming ability:

"I believe individual artists should dictate the possibilities of their chosen media, and not leave it to the Adobes and Macromedias of the marketplace. The notion of artists creating their own tools is as old as art itself. For centuries, artists ground their own pigments, plucked pig hairs to make their own brushes, and primed their own canvases with glue made from boiled rabbits. Instead of distracting artists from their true purpose, these crafts actually tightened artists' connections to their materials and processes." ("Designing with Code: One Artist's Journey")

WMC_e4 artists need no single consent. But within the broad trajectory, we share the following concerns:
* to promote programming literacy among artists: to treat technology as an "artistic medium" instead of a "tool";
* to promote the appreciation of computational art among the general public by foregrounding computation thinking in the exhibited works; and
* to embrace interdisciplinary artistic research, especially to rediscover generative/computational elements in contemporary art practices

(December 28, 2010)

「書寫」-- 其支援、賦予、以至運算式思維

/ 黎肖嫻

[中文文章摘要：何禹旂]

2010年12月16日谷歌悄悄地公佈了它的電子書庫，自此公眾得以在線免費閱讀近520萬冊數碼藏書，你不單可以一本一本地翻閱，還可以透過網上介面進行搜索、連結，這個電子書庫不單為人文學科的研究與教育開展了全新領域，而且還進一步改變我們的書寫方式。現在每當下筆前，我們必須考慮到這些伸手可及、用各種語言書寫，數以千億計的現成文字。文字不再必須從腦中直接書寫出來，它們可以是搜尋出來、連結出來、照搬過來，因襲過去而再轉化成新的。電子書庫是當代種種改變書寫方式的發明之一，但它的影響不是在文字處理（如電腦輸入、排版）或視覺（如列印、電子墨水）層面，而是深入到創作何謂屬於「我」的文字。

運算式思維（computational thinking）是今次《文字機器創作集第四輯》的主題。根據卡耐基梅隆大學（CMU）運算思維中心的使命簡介，它是：「建基於電腦科學基本概念的問題解決方法、以及用於系統設計和了解人類行為」，亦同時是「人類思考和了解世界的基要組成部份。」運算式思維有三個核心特徵：一，抽象層次的創作與工作；二，演算式（algorithmically）思考，並著重於歸納法；三，在工作中注重「均勻縮放」（scaling）的原理（http://www.cs.cmu.edu/~CompThink/）。運算式思維或許是沿自電腦，但它也是一套可以應用於程式編寫外，如解決社會難題和藝術創作的思維模式。

在過去三期的《文字機器創作集》中，運算式思維一值是重要的一環。於我們來說，「書寫」是任何把獨立單位組織成系統的活動。而系統組織過程中的連結、排列、歸類則是書寫當中的「表演性」。書寫的「藝術性」，則在於作品透過書寫系統把資料或原料轉譯、重編，出現和最初截然不同的樣貌。《文字機器創作集第四輯》中不少的作品都以文字語言以外的方式表達上述的書寫與運算式思維概念。當中有放大書寫中的表演性（何禹旂／譚慧心）、探索演算式思維中的無限可能（黃照達）、關於算式演算過程中的連接與程序（黎肖嫻／伍紀穎，以及蘇慧怡）。而涂業生、何佩霖與Vasco Paiva的作品則是利用跨媒體的轉譯過程，去顛覆本來基於語義的編碼與解碼，可以是從影像到文字、從文字到圖案，又或者是把空間的量度化成聲音。

對於孫詠怡/ Helen Pritchard 與Mary Flanagan，她們關心的則是網上社區與社交媒體，孫詠怡/ Helen Pritchard讓觀眾嬉戲於從Twitter到手機的信息編碼／解碼活動，而Flanagan則帶領觀眾去看她到虛擬世界盡頭的旅程。羅海德、周嘉年/ D. Fox HARRELL和葉旭耀的作品則以影像方式揭露了電腦架構中內嵌的語言本質 。

從以上作品，我們可以見到機器、書寫與創作的不同可能性，當中有把運算視為一種超越程式編寫的思維模式，亦有堅持程式編寫為一種獨有的藝術媒體。《文字機器創作集第四輯》中的作者無需為此達成一致的定位，但在林林總總的詮釋中，我們都抱有一些共同的看法：

－提倡藝術家應該理解程式碼，把科技視為「藝術媒體」而非單純的工具
－透過融合運算式思維於作品中，讓公眾了解和欣賞電腦藝術，擴大「電腦藝術」所涵蓋的
－進行跨學科的藝術研究，從當代藝術中重生找回當中的衍生性和演算性元素

Table of Content

WMC_e4 Production Team List
文字機器創作集第四輯製作團隊

The Writing Machine Collective 文字機器創作集

Linda LAI 黎肖嫻	Artistic Director, Founder 群體發起人 / 藝術總監
Justin WONG 黃照達	Co-Artistic Director 藝術總監
Hector RODRIGUZE 羅海德	Research Director 研究總監

WMC_e4 Production Team List 文字機器創作集第四輯製作團隊

Linda LAI 黎肖嫻	Project Chief / General Editor 藝術總監 / 編審
Justin WONG 黃照達	Art and Technical Director 美術與技術總監
Michelle ROCHA 羅慧欣*	Producer 監製
Jolene MOK 莫頌靈	Deputy Producer 副監製
Howard CHENG 鄭智禮	Exhibition Designer 展覽設計
WAN Ka-nok 溫家諾	Deputy Exhibition Designer 副展覽設計
Edith YUEN 袁蕙嫜	Graphic Designer 平面設計
HO Yue-jin 何禹旃	Executive Editor (Proceedings) 執行編輯(特刊/場刊)
Daniel CHONG 莊德華	Art Instructor (Primary School Program) 美術導師(小學教育活動)
CHOI Sai-ho (S.T.) 蔡世豪	Image-and-sound Artist (Opening) 開幕禮表演藝術家

* Appears through the courtesy of the Hong Kong Dance Company 承蒙香港舞蹈團批准參與

Youth Square 青年廣場

LAM Yuk-lan Sandy 林玉蘭	Customer Relations & Marketing Manager 客戶關係及市務經理
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Youth Square

Participating Artists 參展藝術家

CHOW Ka-nin Kenny 周嘉年 /
D. Fox HARRELL

Mary FLANAGAN

Enrica HO 何佩霖

Programmer(電腦程式員): TSUI Yee-lok Nothize 崔以諾
Research Assistant(電腦程式員): LO Ling-kit Rebecca 羅令潔,
LAM Kwan-yu P 林君諭, HUI Ka-yan Claire 許嘉欣
Technical Assistant (技術協力): LEE Jin-ying Joanna 李錦瀅,
LIN Yan-kai Anka 林欣佳, TSUI Wing-hin 崔榮軒

HO Yue-jin 何禹旃 /
Iras TAM 譚慧心

Technical Artist(技術協力): Eagle CHENG, Tony TAM 譚振邦

IP Yuk-yiu 葉旭耀

Linda C.H. LAI 黎肖嫻

Technical Artist 技術協力: Gary NG 伍紀穎
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Winnie SOON 孫詠怡 /
Helen PRITCHARD

Zoie SO 蘇慧怡

Told TO 涂業生

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Video Screening 錄像放映

AU Wing-yan Step 區詠欣 / CHAN Ho-choi Carla 陳好彩 / CHUNG Ho-yan Winnie 仲浩甄/ KWAN Tsz-wai Alan 關子維 / KWOK Chui-han Bao 郭翠嫻 / LI Yi-fung 李倚風 / MOK Chung-ling Jolene 莫頌靈 / Vasco PAIVA / POON Wan-yi Doris 潘韻怡 / Hector RODRIGUEZ 羅海德 / Wong Chi-Chuen Kenny 黃智銓 / WONG Chun-hoi 王鎮海 / WONG Fuk-kuen 黃福權 / WONG Pak-ki Keith 黃柏麒 / WONG Wai-kin Kenji 王偉健 / YUEN Nga-wing Iriz 袁雅詠

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