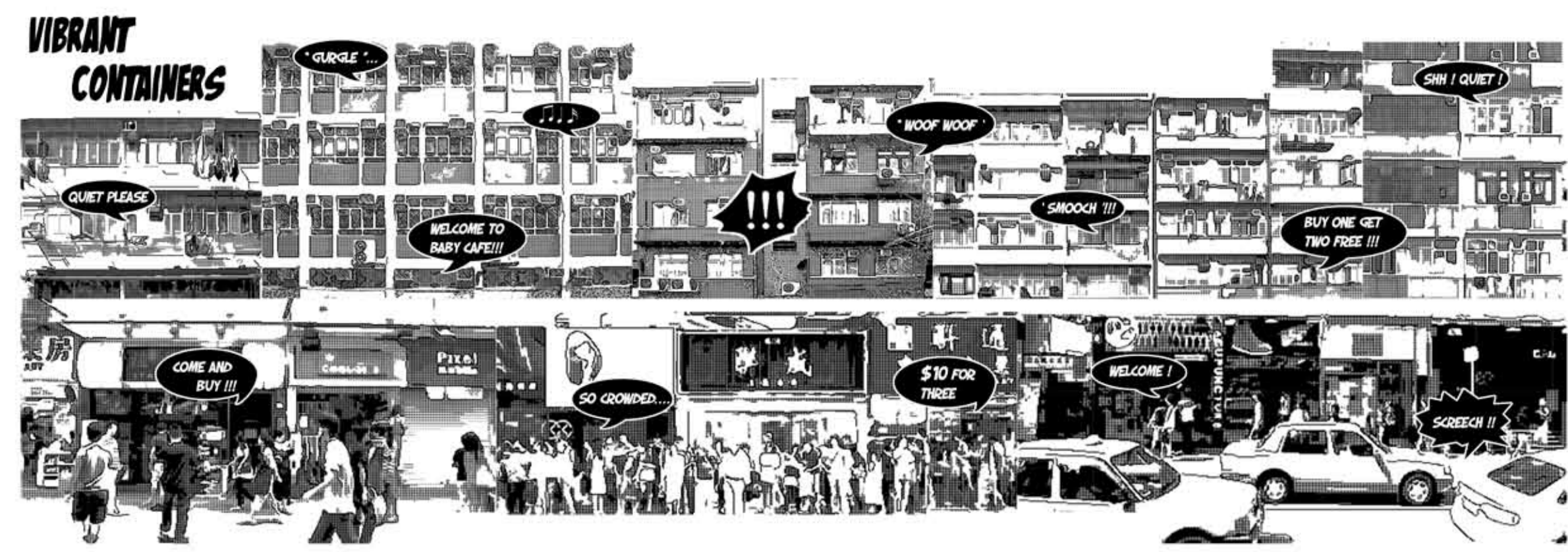# MANGA ARCHITECTURE

Non-photorealistic architectural depictions can be employed to develop a narrative that engages the reader with not only the visual aspects, but also other emotional reactions. Architecture is subsequently not only represented through its factual dimensions of length, width and height, but is extended to intangible sensorial realms, which gains special value in the Asian context. This paper presents a rendering system of a graphical depiction method to communicate design akin to Japanese cartoon (manga) style. The modified visualization can be used for storytelling and developing a narrative that professionals and laypersons alike easily can access, understand and interact. The bi-tonal depictions offer users to experience both, visual richness of the original design, as well as enhanced architectural design communications that have their heritage deeply rooted in Asian culture.

In this paper, we will showcase some digital manga architecture to demonstrate how design intention and ideas can be represented differently yet subsequently seamlessly connects cultural aspects of storytelling with architectural design allowing an intuitive discourse with architecture.

MANGA TECHNIQUES

The typical five drawing steps for producing one manga image-frame. First, artists decide the perspective and roughly sketch the major structure if the scene with pencils (Step 1). Next, they finalize the drawing with ink (Step 2). With the precise lines in place, artists then begin the screening procedure. Based on the inked lines, manga artist usually select appropriate pre-print screen sheets to fill regions in order to express shading, tone, texture, or atmosphere. The selected screen paper, which is semi-transparent with pre-printed patterns, is then overlaid on each of the target regions (Step 3). The artist usually uses a knife to carefully carve out screen paper along the boundary and paste it on the target region (Step 4). The manuscript is ready for print when all the regions are overlaid with selected screens (Step 5).
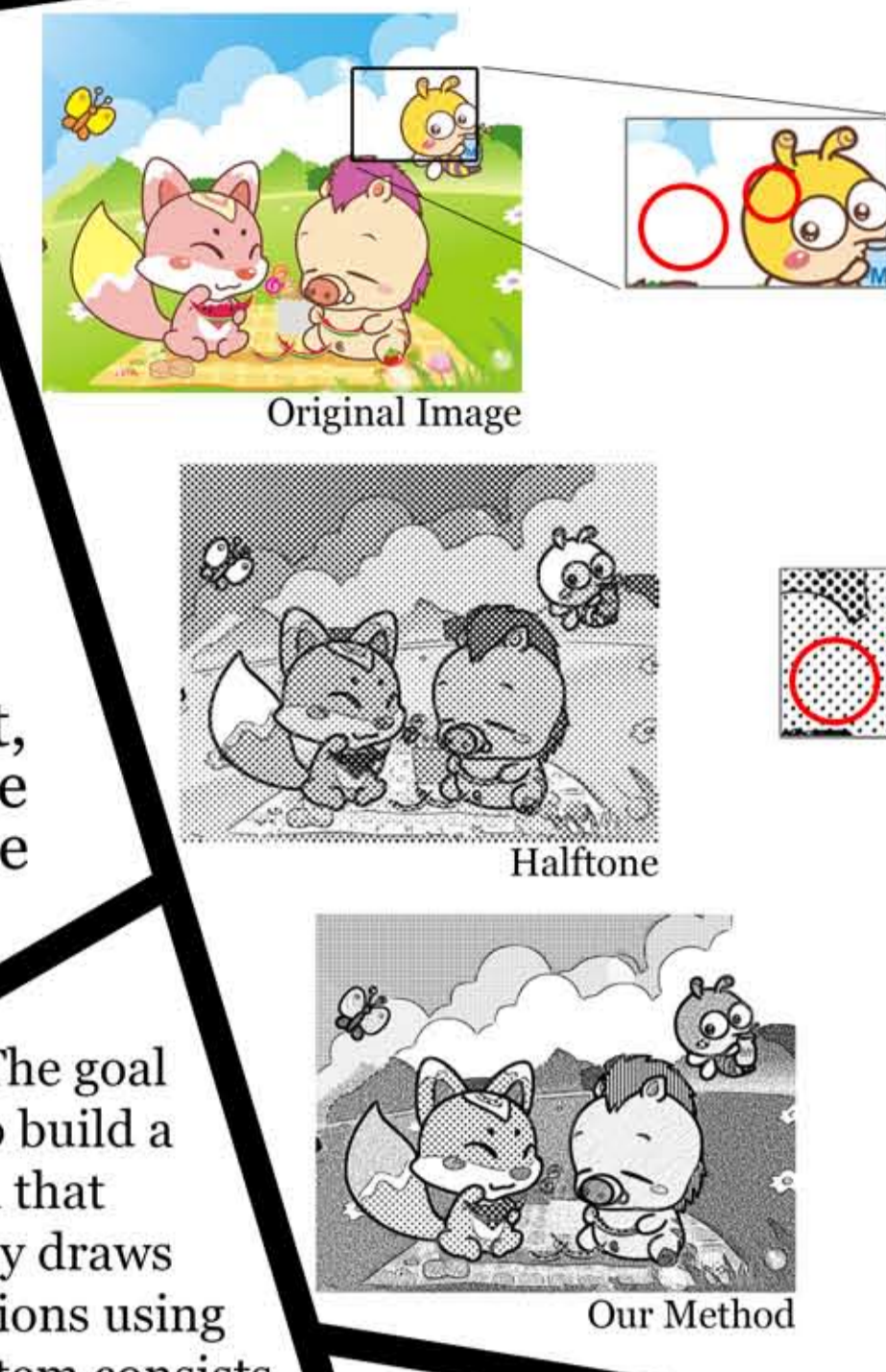
The goal is to build a system that automatically draws architectural depictions using manga techniques. The system consists of two major components, screening and line drawing, which are similar to the conventional manga production described above. The line drawing includes an importance model that ranks each line, allowing architects to control the detail level of lines needed in their architectural manga. For the screening process, the system aims to automate the screen selection process allowing richness preservation and style consistency to traditional manga by utilizing the solution that automatically selects appropriate bi-tonal screens to represent (or fill up) different regions in the photograph.

Texture & Tectonics
Michael Ting portraying textures and tectonics

Journey
Yau Wing Lam showing her first day of school to the new architecture building at CUHK

ON THE FIRST DAY OF SCHOOL...

HEADING TO BUILDING F

WOW!!!

Screening   Line Drawing

CAPABILITY

COMPARISON

This novel representation is especially useful in context of architectural depictions. Given an arbitrary colour image of an architectural arrangement, our computational method can instantaneously transfer the input into a bi-tonal multi-screening texture representation. Since architectural design is rich in details and elaborated in high levels, the process of creating an adequate illustrative sketch becomes even more complex.

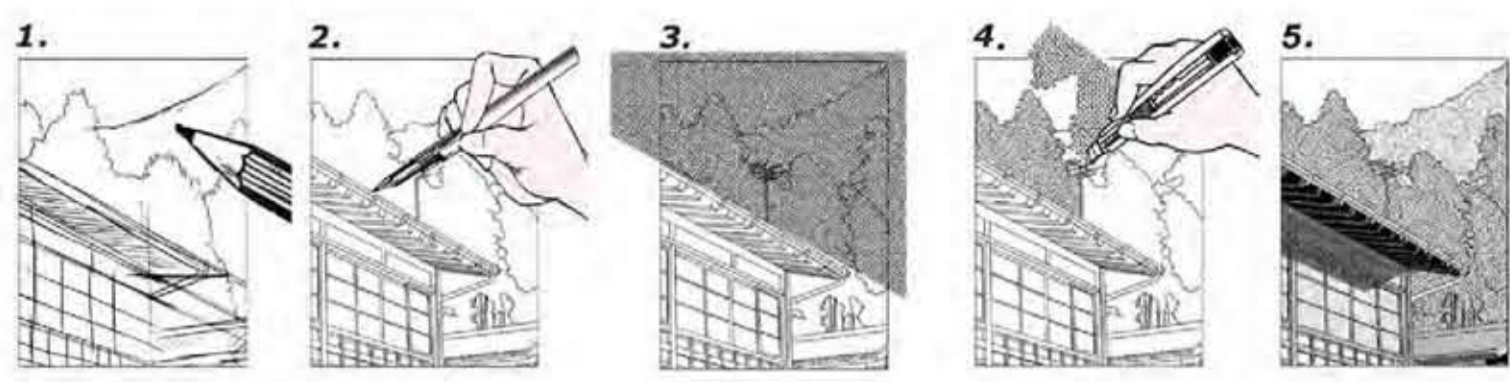Original   Hatching   Halftoning   Our method

ACCURACY

To speed up the production time of drawings, some artists already employ computer techniques to convert images to hatching effects, using techniques such as 'half-toning' or 'hatching'. However, these digital methods produce only monotonous patterns and unsatisfactory results that are not in line with the rich expression of colour graphics and elaborated architectural details in sketches.
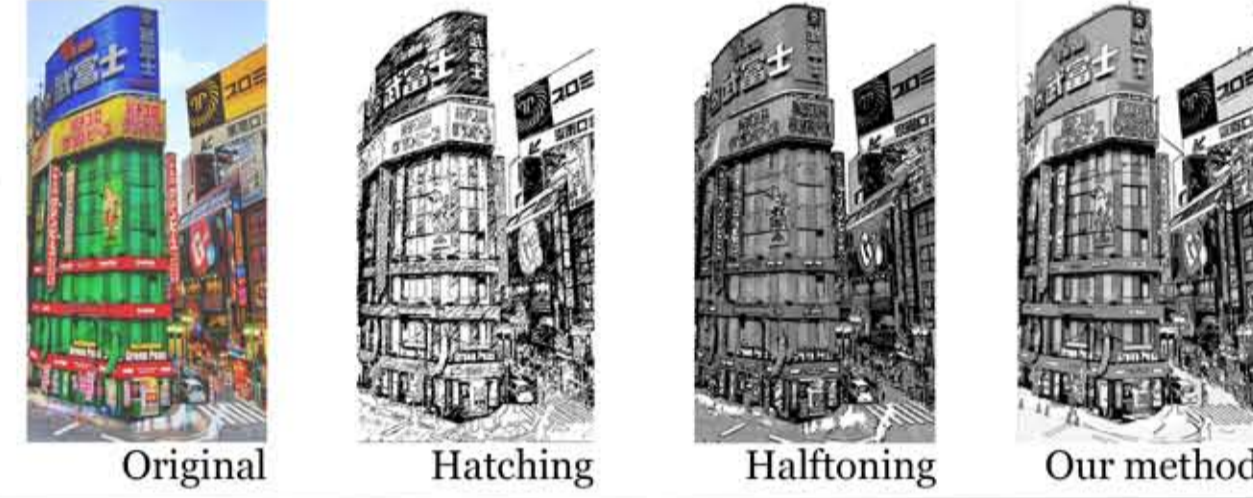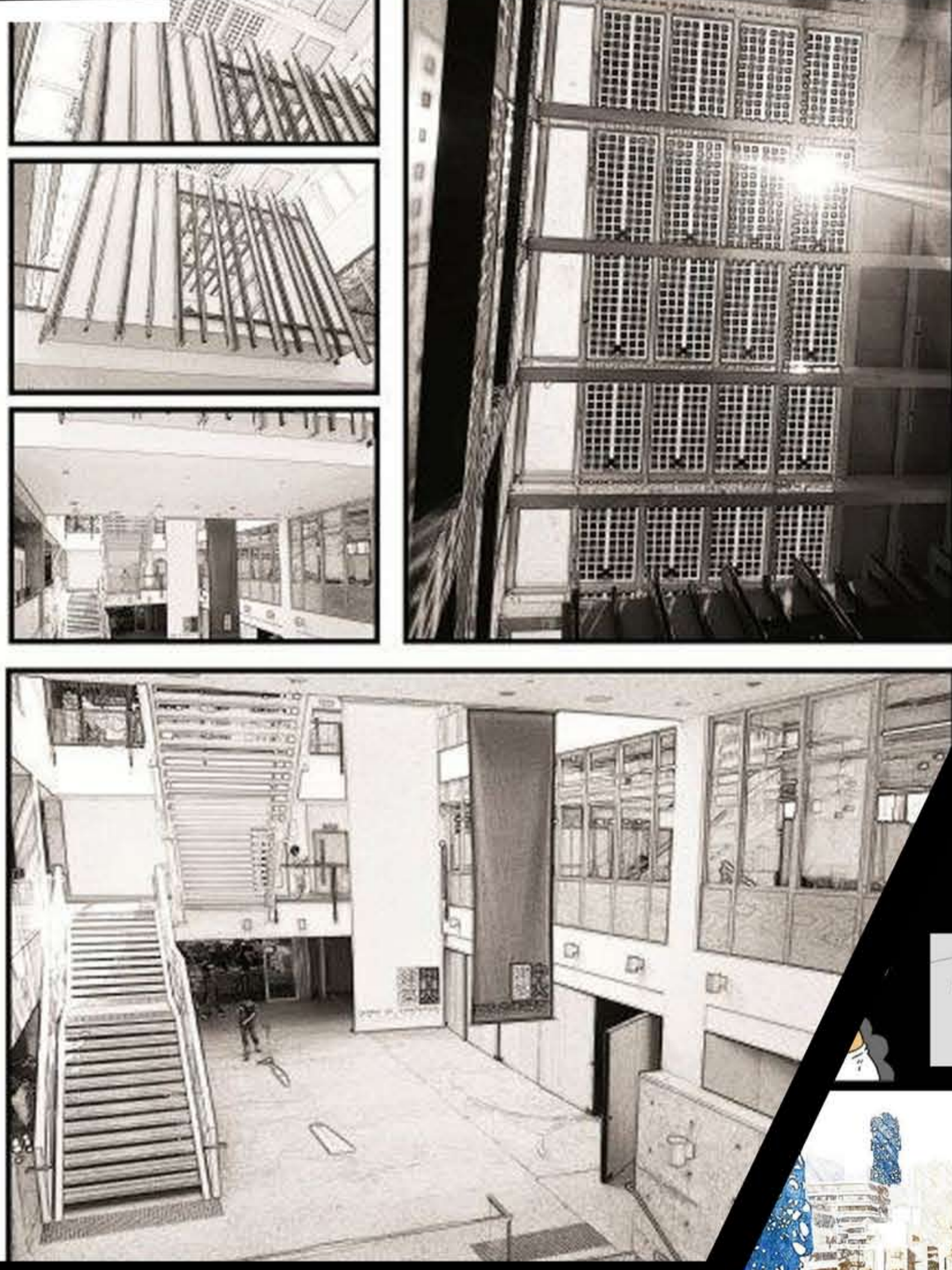
Our technique can deal with an arbitrarily complex image or colour palette. Rich sets of texture patterns/screens are employed to represent the original image with the goal of preserving three key-factors of graphical representation:

chromaticity distinguishability, texture similarity', and tone similarity. While the tone is preserved by matching the density of the tone with the one of each texture pattern, the core contributions of our method is the preservation of chromaticity distinguishability in a harmonic way; in other words to keep the perceptual distances between chromaticity by using variety of patterns.

Original Image
Halftone
Our Method

ANOTHER REPRESENTATION

This method of visual communication provides another realm for representing drawings, architectural designs and even photographs. The b/w lines and pattern representation of this manga representation is very similar to conventional architectural drafting, in other words, bi-tonal representation, but it provides better personal engagement and legibility to non-professional.

Jeremy Ham's Residence, Geelong, Australia

THE CHAOS THEORY
ORDERLY CHAOS : THE ARRANGEMENT BEHIND MONG KOK

HOW IS MONG KOK SO DENSE, SO CHAOTIC, SO LIVELY TWENTY-FOUR HOURS OF THE DAY?

Walkthrough
Winnie Tam portraying her personal story of the AIT-building

Motion
Kenton Sin: it depicts the seemingly chaotic arrangement of the urban setting and their impact on humans' movements through the streets of Mongkok

PATTERNS ON ELEVATION
Design skyscraper in Mong Kok

When I walked around Mongkok, high dense old buildings were very eye-catching to me. The windows, air-conditioners and advertisements on the elevations of those buildings are very interesting. In fact, they formed patterns in the urban area and give me architectural ideas.

Program: Mixed-use

Merge residential and commercial spaces within the skyscraper.

Not dividing the skyscraper into two separate parts to fit the program.

Residential and commercial can be next to each other or on the same floor.

NAME: PROF MARC AUREL SCHNABEL
POSITION: PRINCIPAL INVESTIGATOR
AFFILIATION: SCHOOL OF ARCHITECTURE
CHINESE UNIVERSITY OF HONG KONG (CUHK)
EMAIL: MARCAUREL@CUHK.EDU.HK

NAME: PROF XU XUEMIAO
POSITION: CHIEF INVESTIGATOR
AFFILIATION: SCHOOL OF COMPUTER SCIENCE & ENGINEERING
SOUTH CHINA UNIVERSITY OF TECHNOLOGY
EMAIL: XUEMX@SCUT.EDU.CN

NAME: PROF WONG TIEN-TSIN
POSITION: CHIEF INVESTIGATOR
AFFILIATION: DEPT OF COMPUTER SCIENCE AND ENGINEERING
CHINESE UNIVERSITY OF HONG KONG (CUHK)
EMAIL: TTWONG@CSE.CUHK.EDU.HK

NAME: DR QU YINGGE
POSITION: CONSULTANT
AFFILIATION: DEPT OF COMPUTER SCIENCE AND ENGINEERING
CHINESE UNIVERSITY OF HONG KONG (CUHK)
EMAIL: INGE.QU@GMAIL.COM

Manga MangaManga MangaManga Manga

NAME: SKY LO TIAN TIAN
POSITION: RESEARCH ASSISTANT
AFFILIATION: SCHOOL OF ARCHITECTURE
CHINESE UNIVERSITY OF HONG KONG (CUHK)
EMAIL: SKYPUG@GMAIL.COM

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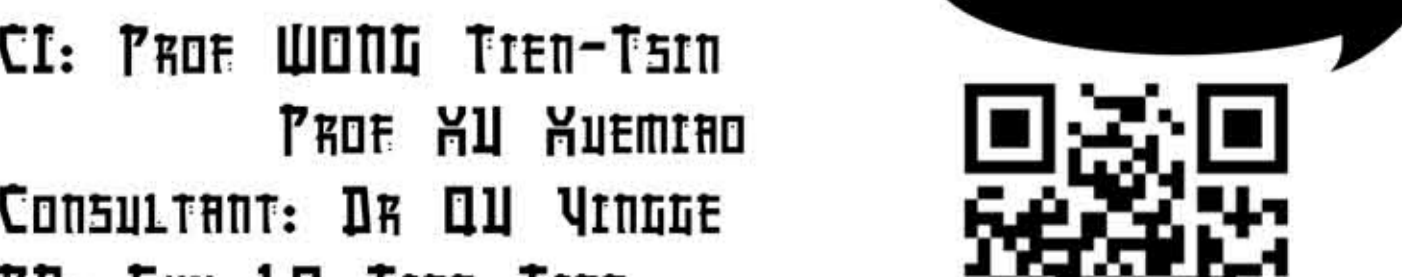
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SCAN ME!!!!!!

MANGA_ME APP - HTTP://MANGA-ME.TK

The Chinese University of Hong Kong