Abstract. Bi-tonal and non-photorealistic architectural depictions can be employed to develop a narrative that engages the reader with both visual aspects and other emotional reactions. Using this story-telling approach to communicate architectural design is subsequently not only represented through its factual dimensions of length, width and height, materials, structure or technical details, but is extended to intangible sensorial realms, which gains special value for laypersons and professional alike. This paper presents how architects and laypersons develop a narrative of their architectural design proposals or concepts using a visualisation and story-telling tools that generates designs akin to Japanese cartoons or manga. Our paper presents the methodology, the instruments used and highlights on the base of representative samples of how narrative bi-tonal depictions of architecture contributes to the overall understanding of an architectural design and how non tangible factors aid the designers in their communication.

Keywords. Digital manga; architectural depiction; visual communication; story-telling.

1. Introduction

An architectural narrative is the main methodology which architects used to present their design to their clients. Computer Aided Design (CAD) tools has progressed significantly in the past decades and architects now often use them to generate depictions that comes in the form of photo-realistic rendering, video walkthroughs, or a series of computer-generated diagrams, while there are fewer and fewer hand sketches or bi-tonal images. However, to communicate the design to a wider audience and to allow a layperson to better grasps the elements of architectures, a different form of presentation can be supplemented. Digitally generated, bi-tonal, non-photorealistic depictions provide another realm for representing drawings, architectural
designs and photographs. Japanese comics -manga- where the artists lay multifarious screens to express different semantics, is related to conventional architectural drafting with their various a black and white (b/w) patterns and representations. The technique of a narrative also provides a stronger personal engagement and legibility to non-professionals. In this paper, we will present the ease of generating manga architectural narratives and how they can be used as a form of architectural presentation as well as tool to help generate design ideas in the first place.

2. Traditional to Digital Manga Depiction

Manga has been widely known as a medium to narrate a story to reader. The task of drawing a manga series is however, rather tedious, time- and labour- intensive, especially when large amount of irregular regions exist.

A system that automatically draws architectural depictions using manga techniques was therefore created, called Manga-Me (Qu et al., 2008). Although there are numerous tools available to convert any input image, sketch or drawing into a bi-tonal manga screening, the generated hatching or halftone images does not look like traditional manga compares to the image generated by the system (Figure 1). Manga-Me is an iPhone-application (Manga-Me, 2010) that allows users to blend from a photorealistic to an abstract depiction of architecture using a distinct expression of manga style visual communication. The system is described in Schnabel and Qu (2011).

![Figure 1. (From left) Original image, Hatching, Halftone, Manga-Me solution.](image)

3. Rendering Bi-tonal Architecture Depiction

The current mainstream method of presenting an architectural design idea or concept is with photorealistic picturesque depiction of the design. The main idea is to provide a realistic impression of the building design before it is built. As seen in
most architecture books and magazines, they are a series of images that are so real; it is difficult to differentiate it from a photograph. However, architectural spatial concepts such as geometry/composition, threshold, proportion/scale, circulation/duree, light/shadow and tectonics are lost in the colourful well-rendered details and impressions. Compared to architectural images sketching in the past where these architectural elements, properties, functions, or materials are commonly represented by standardized screens, hatches, line-types, -styles, and -widths, one can easily realised drawings, sketches, and diagrams can translate architectural spatial concept clearer. Our technique allows for the development of a new generation of architectural design communication that reaches beyond graphical standard depiction of architecture and including intangible elements and expressions.

Conventional rendering presentations missing a crucial element in their communication: the missing narrative. A series of images, collages, diagrams, photographs or rendered images do not provide the reader any clue about how the design comes about, how it blends into the urban environment, how the building functions, and especially how emotions, atmospheres or expressions relate to the design. Standardised depictions provide the outlook and practicality of the building only. Digitally generated, bi-tonal, non-photorealistic depictions are increasingly becoming popular around the world as a mean of expression because of its distinct graphical quality with its elegant use of rich set of screens, tidy and fine drawing styles of b/w drawings, and its engaging ways of storytelling (Schnabel and Qu, 2012). For example, the commonly used software SketchUp™ provides a few additional options that change the line style of a model, giving it a unique raw outlook, mimicking hand-sketching, in order to portray architecture in a simple outlook with just its basic geometric elements. The Bjarke Ingels Group (BIG) is a Copenhagen and New York based group of architects, designers, and theorists operating within the fields of architecture, urbanism, research and development. Based on the idea of storytelling, their book ‘YES is More’ (Ingels, 2009) introduces their works through the format of a comic book. It is a playful gesture to make architecture accessible and less formal. BIG ads speech bubbles and overlaid diagrams to their architectural designs, making them appear to be alive and talking to the reader. Although most images are simple photographs, yet the overall style is novel to how they convey architectural ideas and designs to the general public and professionals alike. Akin to this, our architectural manga goes even further to give architectural representations an enhanced immersion that goes beyond conventional architectural depiction.

4. Manga Architectural Narrative

A cohort of fifty of second year undergraduate- and thirty first year master of architecture students created an architectural narrative based on manga. The aim
was to introduce the newly opened building of their School of Architecture (AIT), at the Chinese University of Hong Kong (CUHK), or alternatively capture the particular urban setting of a high density and vibrancy neighbourhood in Hong Kong, called Mongkok. They used the free Manga-Me application, which converts photographs (e.g. taken by the phone itself) into manga images. Students then used the converted bi-tonal images to lay them out on maximal two panels by using either typical manga templates (predefined subdivisions and image frames of pages) or their own generated layouts to generate a short architecture story. The pages were uploaded onto a social network group (CAAD@CUHK, 2012) for comments dissemination and evaluation among a larger audience. This not only inspired other students, but also generated variations and sequels to emerge.

Figure 2 show the initial representative outcomes of the above described manga-task. The outcome was promising as students were able to utilize the unique quality and characteristic of manga to narrate a certain story or journey that is closely related to architecture. These examples act as initial framework of how designers use the medium to develop an architectural manga digitally.

The manga-based representations of design can facilitate learning various theatrical and practice design aspects. Hereby the methodology can be a semiotic resource in learning and help learners see factual relationships together with projected, intangible elements to their designs (Herbst et al., 2011; Tatalovic, 2009).

The above described method allows a different understanding and reflection of the sites. In conventional site analyses designers collect a variety of data that are related to the site, though they are often not used any further in their design activities. The plot of a narrative is comprised of a series of “things that characters do,
feel, think, or say” (Dibell, 1988). Hereby each of the events must be important to the outcome of the story. A list of events or incidents alone is not a plot. The events must be “significant events” rather than a simple series of things that happen. Students are sometimes confused, however, by the difference between a series of events that happen at their site and the key elements that are significant to the story of the site. In our exercises, students select their own topics for their personal narratives and then generate a comic-strip to reinforce the structure of their narratives. Finally, in their next steps of reacting architecturally to their findings presented in their manga students generate their own designs based on the comic strip prewriting activity, keeping the elements of a narrative not only in mind but also as their influential design parameters.

5. Design Ideas and Presentation

The students were then given the freedom to insert the use of the manga application into any stage of their architectural design process. This section shows the various stages at which the manga application is used and in which way. Details of the posting can be found at the course social network websites CAAD@CUHK (2012) and Ornaments and Patterns (2012).

5.1. FORM-FINDING

The manga presented in Figure 3 below demonstrates how the application gives the student a different perspective in her studies of the urban fabrics. By removing the colours of the original scene, the application enhanced the overall patterns of the urban setting and made them more distinct. The student made use of this by basing her further design development on the found patterns.

![Figure 3. Design by Anita Au: form generated from the studies of urban functions.](image-url)
5.2. FAÇADE STUDY

Figure 4 further below shows how a student uses a very similar visual study technique to generate a façade that construct a dynamic out of the elevations of the urban setting. By extracting, outlining and then overlaying the layers of patterns, a unique façade system that can blend into the seemingly chaotic Hong Kong urban setting is created. This is possible due to the monotonous yet rich screening of the images generated by the manga application.

![Design by Esther Lam: façade studies using the Manga App as base for her design.](image)

5.3. PATTERN ABSTRACTION

The application also provides great opportunity and inspiration which allows students to use them as a form of abstraction. The next following author fully utilise the pattern that is visualised from the manga-generated image as a source of inspiration for her design (Figure 5).
5.4. NARRATIVE

Students used the methodology of manga to present their design in a different way. Instead of plan, section and elevations, the development of their design and its details became the central element of their design communication (Figure 6). Hereby they used not only a bi-tonal representation of their design, but transferred their experiences gained through the manga methodology to put a narrative into their design communication.

Figure 6. Design by Leo Yu: Using manga as basis to narrate his final design.

5.5. FINAL PRESENTATION

The clear line drawing and simple screening of manga allows designers to use this method as a tool for their final design presentation. The result is simple and clean
providing a narrative of how the design is formed and how it is related to the site context (Figure 7). The author used the narrative of his design development as methodology to present and explain his design.

5.6. MANGA AS DESIGN METHODOLOGY

A student takes up the challenge of using Manga as the main design methodology and aiding tool instead of just using it in one part of the design process (Figure 8). From site study to form exploration all the way to the final presentation, she generated the form that fits the manga character as well as reactive to the site context. This demonstrates strong possibilities with the integration of the tools and design objectives.

Although the use of Manga-Me apps was required from the students at first, it was well received and students started to rely on the apps to get design inspiration. Students use it as a third eye to get a different perspective of the site and environment. The various lines and hatches developed by the apps to overlay the photograph bring out distinct architecture elements which are not captured with a normal camera. Furthermore, students are challenged in terms of design presentation. Instead of a normal perspective rendering, elevation, section, students use a sequence of images to tell a story of their design. This method requires designers not only to represent their designs factual, but also representational with intangible parameters to generate and present their ideas.
6. Conclusion and Future Research

We have demonstrated that with the use of the Manga-Me app to create bi-tonal, non-photorealistic images, the result can be exhilarating. The additional point-of-view not only provides architects new ways to look at the site context and architectural elements, it also gives them a clearer means to communicate their design with a layperson. The technique is efficient and convenient in use in architectural design and its communication. Hereby architectural design communication is extended to a genre that is not only popular and commonly accepted, but also carries rich and meaningful content that merges sketching and digital drafting.

This provides us with the opportunity to use this application as an architecture educational tool. Especially in the context with social networks, which allows a larger dissemination, evaluation and commenting, allowing for innovative communications and narratives to happen. With its clearer depiction of architecture elements, this will provide easier understanding of how building designs are generated and developed. Moreover, the hatching details can teach students how to do hand sketching to bring out specific characteristics of their design. This ‘reverse engineering’ of sketching has the potential to blend over the education of digital and analogue design communication in architectural design.

Akin to Calderon et al. (2006) and Ng et al. (2006) we plan in our future research to address cinematic aspects of our architectural digital manga visualizations and generate animation techniques allowing designers to create architectural animations based on bi-tonal non-photorealistic depictions with the same ease as conventional animation methods.
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