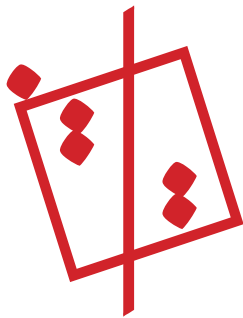


Senior Thesis Book

Harfometry

The study of characters measurements



Maha Abdulaziz alThukair

Advisors:

Dr. Rezan Gassas

Ms. Rawan Hammad

Ms. Alya alQarni

03.Acknowledgment

Foremost, I would like to express my sincere gratitude to my advisor **Dr.Rezan Gassas** for the continuous support of my study and research, for her patience, trust, and letting the semester passes like a breeze.

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Last but not the least, I would like to thank my family: my parents **Abdulaziz alThukair** and **Muneerah alThukair**, for **8444 days** of caring, and supporting continuously, and uninterruptedly.

04.Designer abstract

IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY
COLLEGE OF DESIGN
GRAPHIC DESIGN AND MULTIMEDIA

Designer Statement

Harfometry

Study of characters' measurements

Maha alThukair

May 2017

Harfometry book is a serious effort to help type designers to design a well-proportioned Arabic typeface, by standardizing Arabic calligraphy rules and invent design system and guides to make those rules digital friendly.

The book involves the systematic measurement of the physical properties of the letters, primarily dimensional descriptors of letter size, shape, and its proportions have driven from calligraphy, but now it is digital friendly. It contains six sections, The first three is an introduction, defining Arabic typography and it's assets. The fourth explains the new system and guide the book followed. The fifth section is the letters and their parameters which are Basic shape, Connect, alignment, and dots and diacritics. The sixth section is a template of measured characters.

Beginner Arabic typeface designers have hard times finding references in Arabic about typography. This causes individual efforts to be spent adapting calligraphy principles into typography instead of developing on what others reached. Thus, with all these years of using technology, few well-designed Arabic typefaces have been created.

The main reason behind the slow development of Arabic typography is a scarcity of Arabic resources in the field. That reason leads the designers to adopt Latin systems which cause misunderstanding of letters structures that makes distorted Arabic typeface.

This project is an attempt to, once and for all, make these issues disappear by standardizing calligraphy concepts. In this projects I aim to many objectives, first is to offer an Arabic resource that relies on Arabic rules of designing new typefaces. Second is to enrich Arabic content in the field. Last but not least, Increase the number of well-designed typefaces, providing variations that increase the quality of Arabic editorial design.

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06.Introduction

Introduction

Beginner Arabic typeface designers have hard times finding references in Arabic about typography. This causes individual efforts to be spent adapting calligraphy principles into typography instead of developing on what others reached. Thus, with all these years of using technology, few well-designed Arabic typefaces have been created. This research is an attempt to, once and for all, make these issues disappear by standardizing calligraphy concepts.

Thesis statement

Reviving Arabic calligraphy rules by converting them to digital-friendly rules is going to enrich the Arabic library regarding learning Arabic typefaces basics and standards for designers, which will help solve the lack of well-designed Arabic typefaces.

Objectives

- Offer an Arabic resource that relies on Arabic rules of designing new typefaces.
- Enrich Arabic content in the field.
- Increase the number of well-designed typefaces, providing variations that increase the quality of Arabic editorial design.

Target audience

- The main target audience is beginner typeface designers. Also, it will be helpful for:
 - Arabic typography teachers
 - Foreign designers interested in designing Arabic typefaces
 - Researchers in the same field.

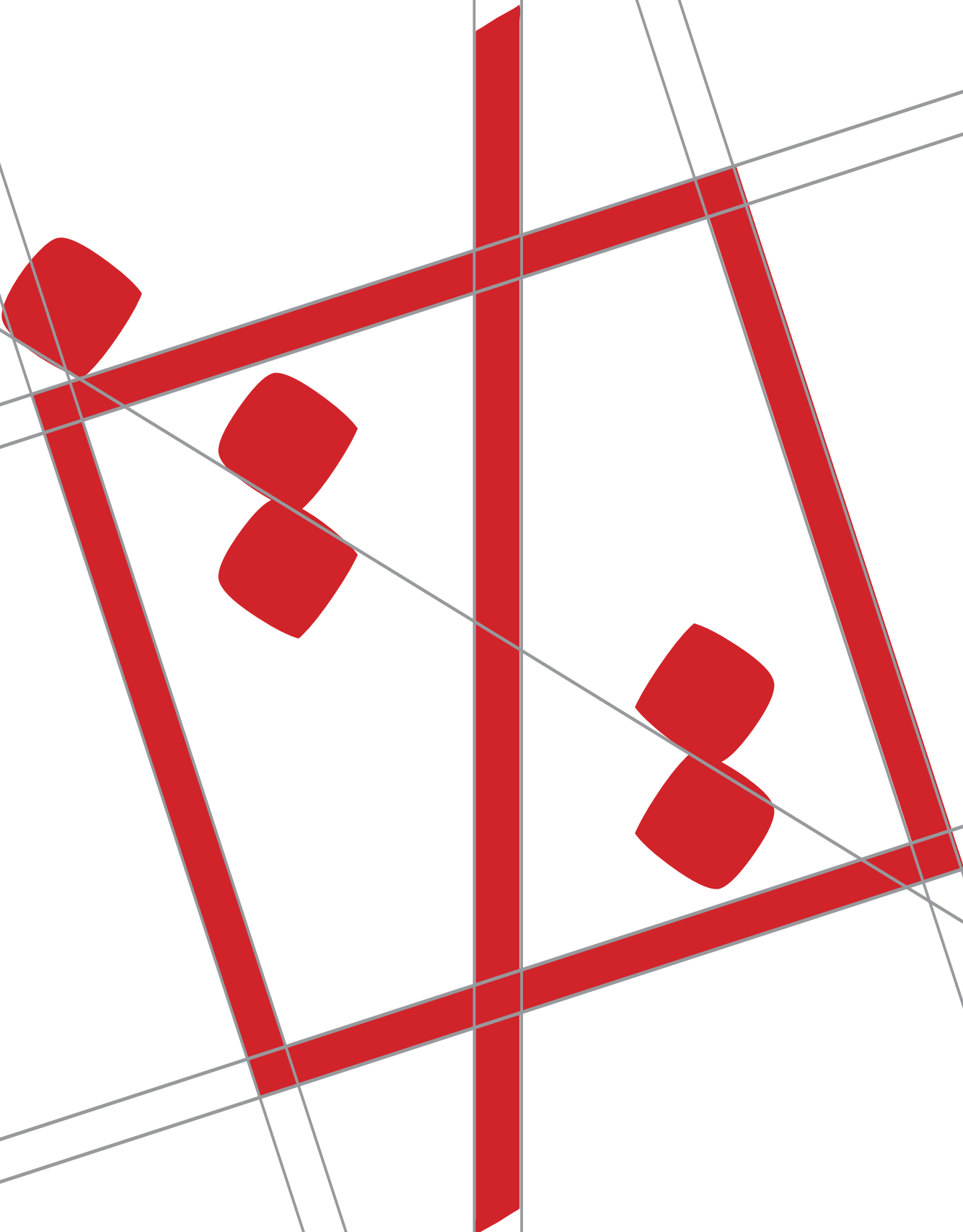
07.Final Thesis Concept and design

Name Philosophy

Harfometry, is a composite word from two original words, Arabic and Greek. The Arabic part is “Harf” means “Letter”, the other part is “-metry” and it means measurements. The part -o- just to sound like the original word. It is driven from Anthropometry (from Greek ἄνθρωπος Anthropos “human”, and μέτρον metron, “measure”) refers to the measurement of the human individual” The Anthropometry has been used for identification, for the purposes of understanding human physical variation. Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape. So as Harfonometry, but is care of letters.

In the second year, we take a Human Factors course, it was the first time I met anthropometry book, and totally obsessed with the Idea that we are living surrounded by well-measured products that make it comfortable and have well-size dresses that make it beautiful. The designs and purposes of the products are different, but the human body measurement is standardized and there is a resource collect this information and put it into a book. In the fourth year, we take typography 3 the course that we have to design an Arabic typeface. Most of the students, if it is not all of them were confused. What should Aleph length be? Ba’ width? and what is the proportions between Meem, and Ha’?

So, as design students we looking for scientific information about Arabic letters to handle it as designers, but there is nothing except old resources that talk about Arabic calligraphy as a calligraphy art. After that, we designed beautiful typeface profiles, but the typeface itself it was, unfortunately, proportionally distorted. I think that process causes individual efforts to be spent adapting calligraphy principles into typography instead of developing on what others reached. Thus, with all these years of using technology few well-designed Arabic typefaces have been created. So, I wondered, why there is not such a resource as an anthropometry for the letters? The measurement standardized, but the designers have to design a dress it’s body. Because I like to be part of the solution, I think of an attempt make this issues disappear by standardizing Arabic calligraphy concepts and publish it by a book calls Harfometry.



Logo and visuals

The concept of the logo is to represent a scale and weight, without writing the name to avoid sticking it on any of six scripts. The name dots used as objects to weight, the balance column is the base line and the square as a scale. $90 \text{ degree} \div 5 \text{ (number of name's dots)} = 18 \text{ degrees}$, there are two dots equally on each side and one more dot on the left that cause the tilt by 18 degrees.



Figure.1
The project corner in
the exhibition
(alThukair,2017)



Figure.2
The Book in the
exhibition
(alThukair,2017)



Figure.3
Inside Pages
(alThukair,2017)

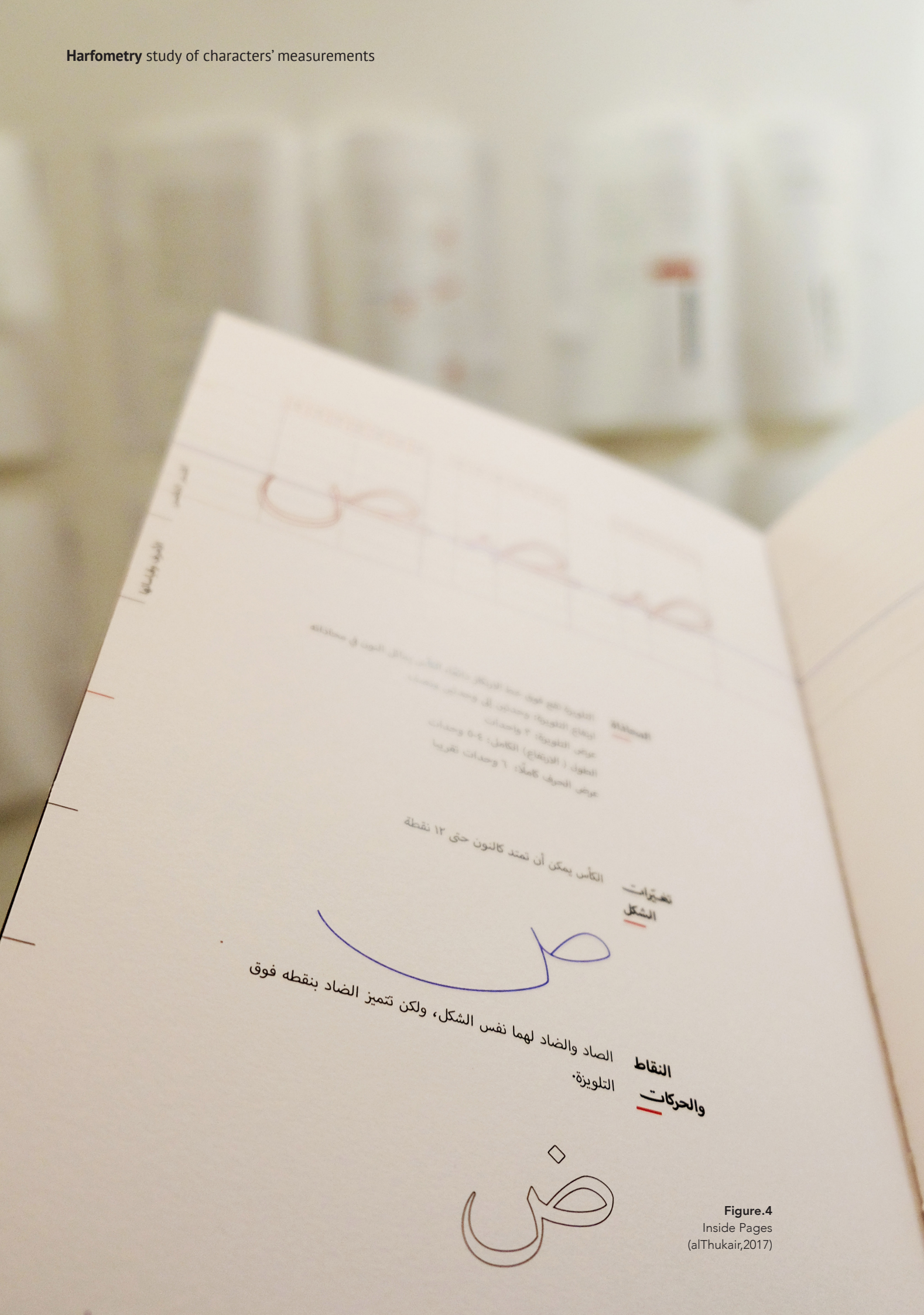


Figure.4
Inside Pages
(alThukair,2017)



Figure.5
Inside Pages
(alThukair,2017)

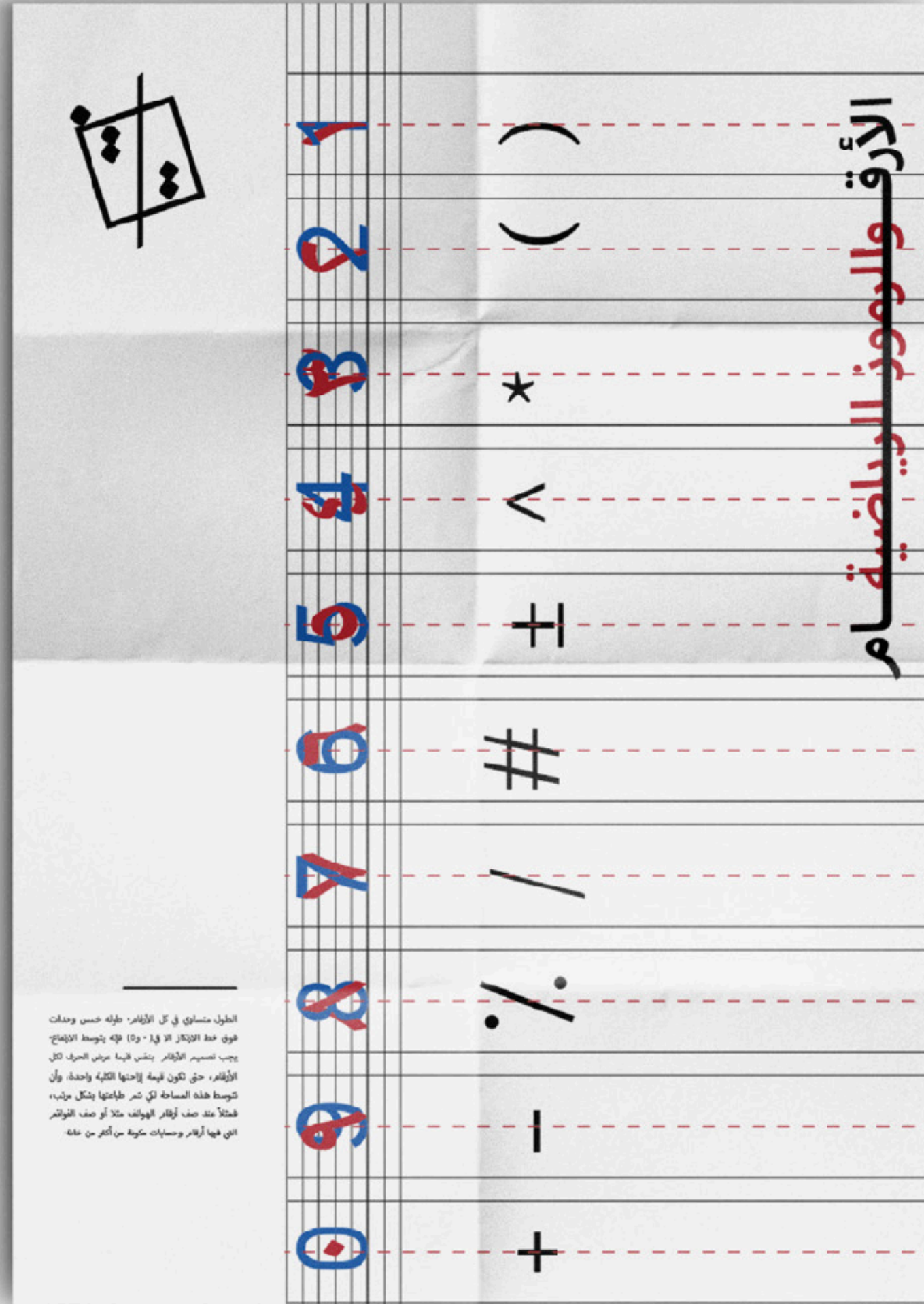


Figure.6
Posters
(alThukair,2017)

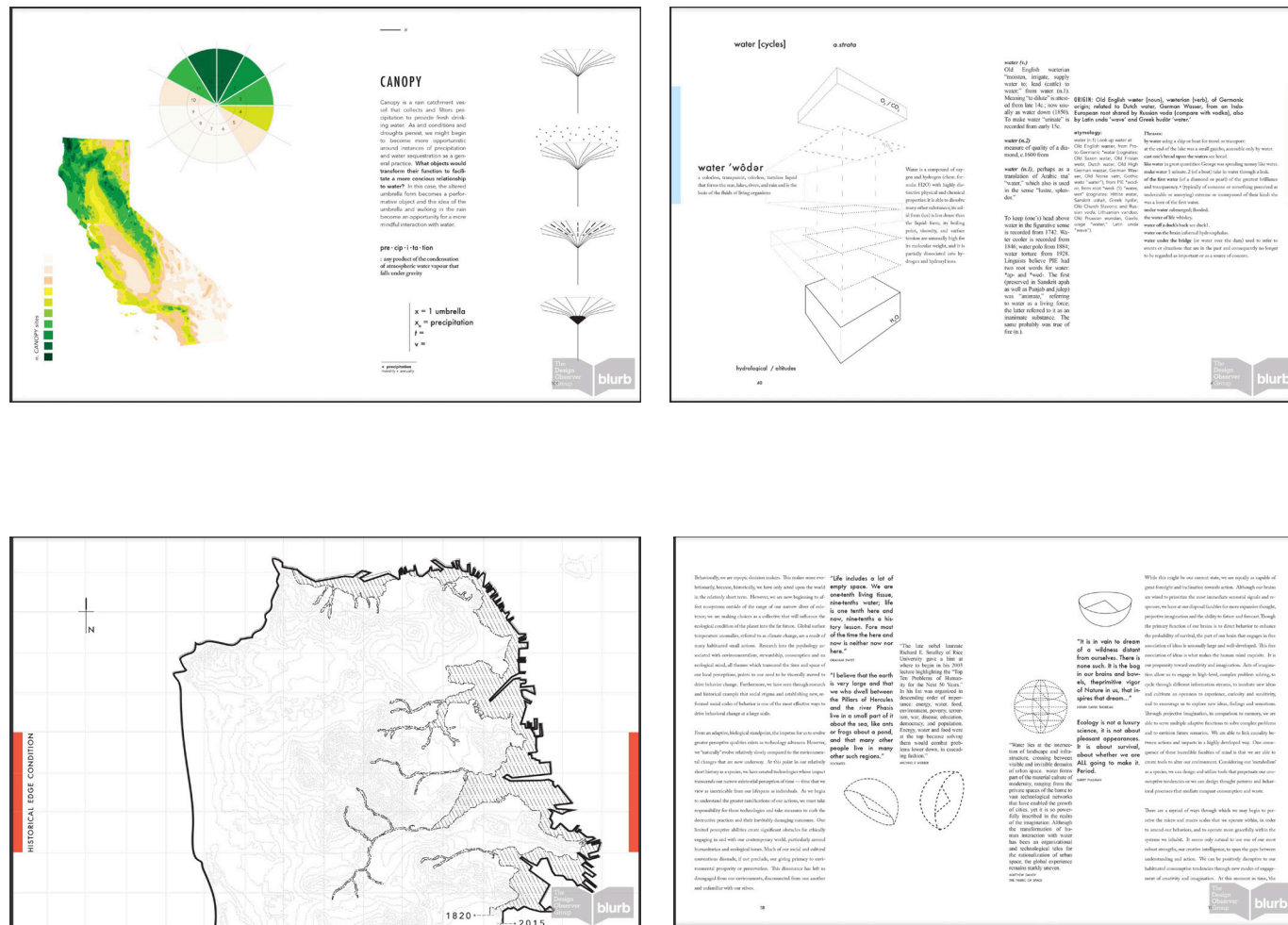
08.Thesis Research
and Process



Figures.7-14
Book example
(S. Yap,2014)

A Retrospect on Chinese
Clans in Singapore

The project concept: Few people realize that behind the humble-looking facade of a Chinese clans lies a rich history that all Chinese deserve to know. The project aims to bring the Chinese origins — how their ancestors came to Singapore, set up small communities, and propagated the Chinese arts and culture into their own localized culture — to light, and also educate today's Chinese youths on the importance of knowing their beginnings. I like how the appearance so related to the subject, the packaging (Fabric) is an old Chinese way of packing, and the binding is a traditional way of their binding books. The accent red color in the pages with the basic appearance of black ink represents Chinese culture. Besides That, using a tracing paper to layer up images in separated pages is good, even though I don't know what it means here, or what indicates to. The layout is clean, lots of comfortable white space. Good contrast between headlines, and body text. Using folded page in the middle of the book make it an enjoyable experience.



Figures.15-18
Book example
(C. Gaitan,2014)



Figures.19-27
Book example
(I. Shkarovska,2013)

Eco Logical Imagination

From Thesis Book of **Cristina Gaitan**, I liked many things: The grid is simple, clear and distinguishable. Anatomical drawings and figures are well placed in the pages. also, needed graphics incorporated as aesthetic elements, thus the book is uncluttered of pointless elements, yet it is beautiful and well designed. The most thing that I disagree with is typography treating, there are lots of unmatched different typefaces. Also, the way of contrasting two texts next to each other is so distracting, large text highlighted by bold, different font, and bigger size at once.

Anatomy Book

Osteology

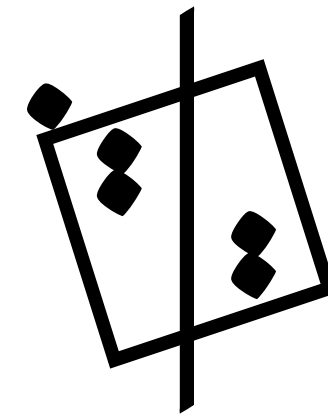
This book looks like a well-designed comprehensive reference. The layout is clean, the grid is so obvious, and how things and element divided is just an excellent for a scientific book. The illustrations are charming. But the problem it may seems boring for visual people as the designers. There are no eye-catching elements especially if the bones become letters.

Common factors in visual research examples

- Black& White, if there is any color become as an accent color not main one, I think because most of them are formal and comprehensive books, there is no one color can represent it better than basics and neutrals.
- The layout is clean, and lots of comfortable white spaces.
- In two of them there is some pages different in material to serve different purposes and makes browsing the book an enjoyable experience

How these examples related to My Project?

My Project is a book of the anatomy of type and letters measurements, From the second example the way of analyzing the lines of writing in the second chapter of my book. The third example, like my project, but in german language. I like the Idea of the poster he designed to hang the information in the workspace and see the elements all the time. The fourth example, the Idea of transparent paper layered oneach other to show the layers of typeface's anatomy. The fifth example, I like the color scheme Black and White, because it is a formal scince book, and even if it is formal there is a touch of fun.



Type

29L Azer

ا ب ت ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق
ك ل م ن ه و ي ا ب ت ث ج ح خ د ذ ر ز س ش
ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ب ت ث
ج د ذ س ش ص ض ط ظ ع غ ف ق ك ل م ن ه ي

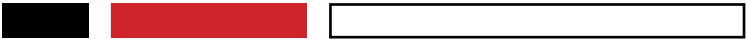
Myriad Arabic - Bold

ا ب ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن
ه و ي ا ب ت ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن
ظ ع غ ف ق ك ل م ن ه و ي ب ت ث ج ح خ د ذ ر ز س ش ص ض ط
س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ب ت ث ج ح خ د ذ ر ز
؛ < > | : = + -) (* ^ % # ! ?
• ٩ ٨ ٧ ٦ ٥ ٤ ٣ ٢ ١
1 2 3 4 5 6 7 8 9 0

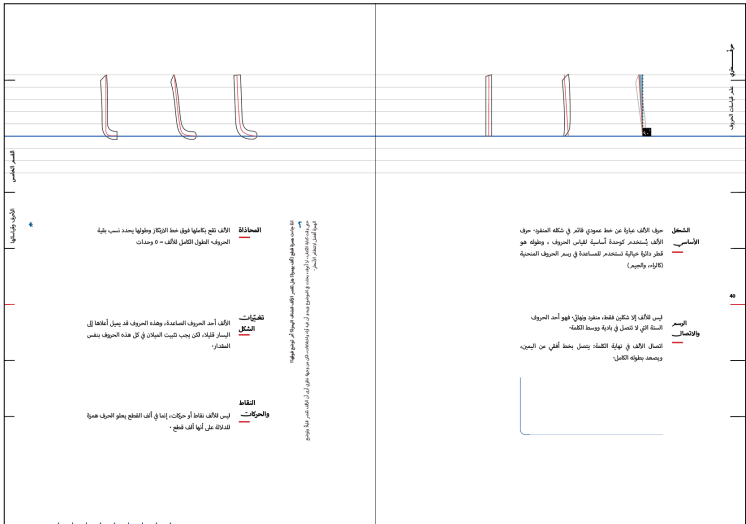
Myriad Arabic - Regular

ا ب ت ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و ي ا ب ت
ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و
ي ا ب ت ث ج ح خ د ذ ر ز س ش ص ض ط ظ ع غ ف ق ك ل م ن ه و
؛ < > | : = + -) (* ^ % # ! ?
٠ ٩ ٨ ٧ ٦ ٥ ٤ ٣ ٢ ١
1 2 3 4 5 6 7 8 9 0

Colors



Chapters layouts



Patterns

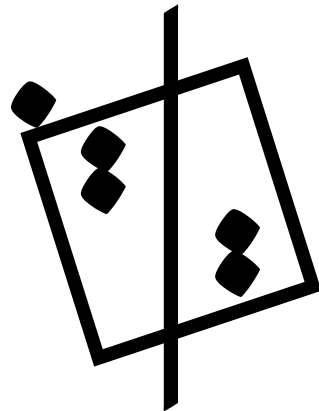
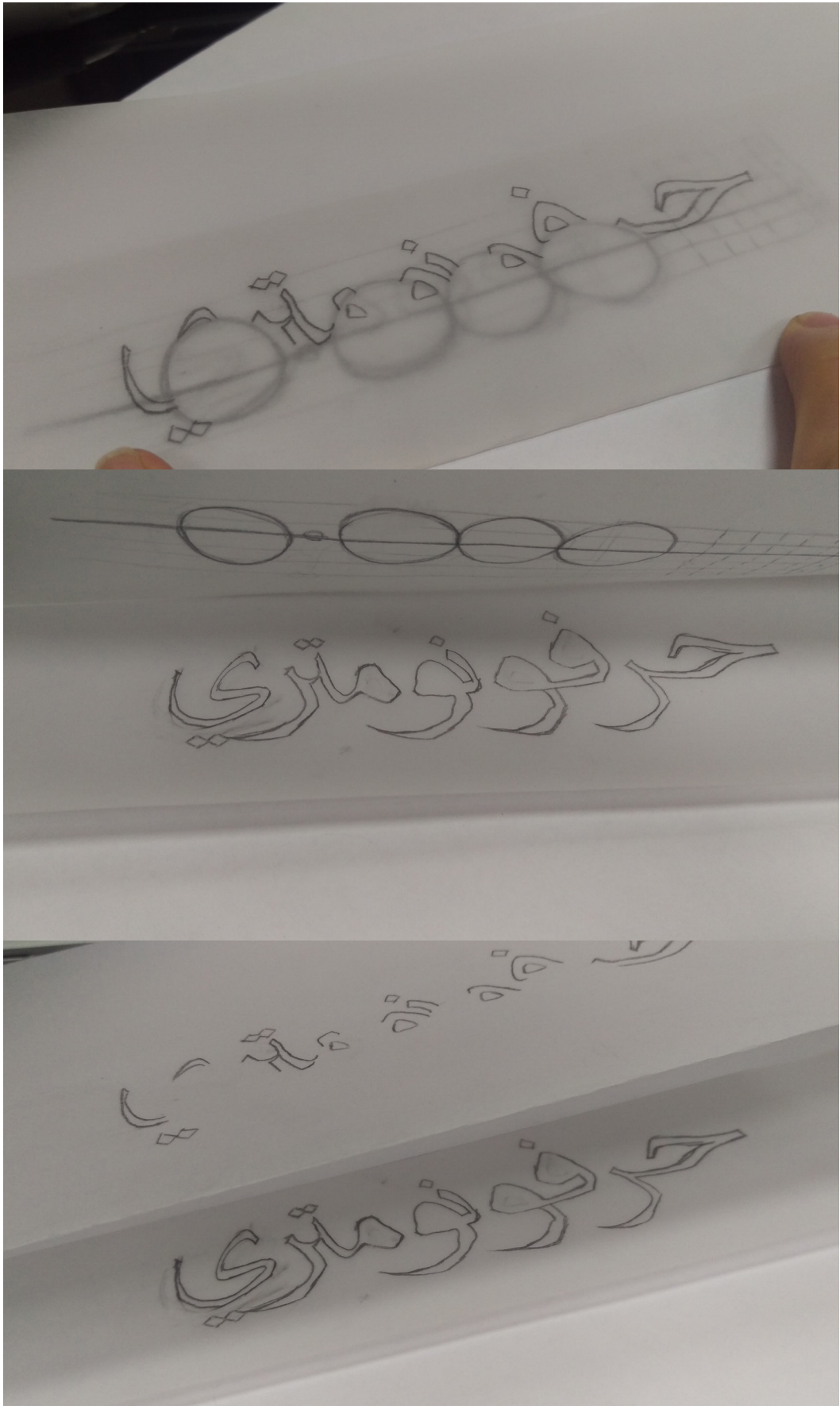
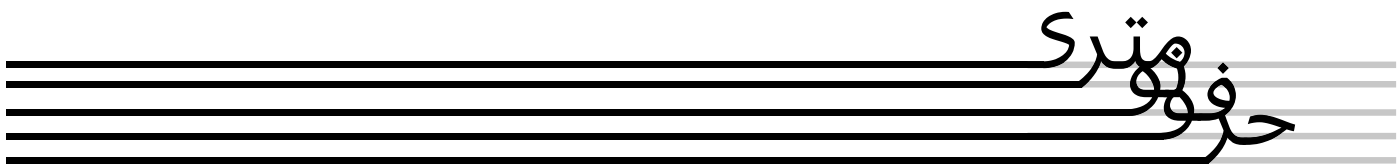
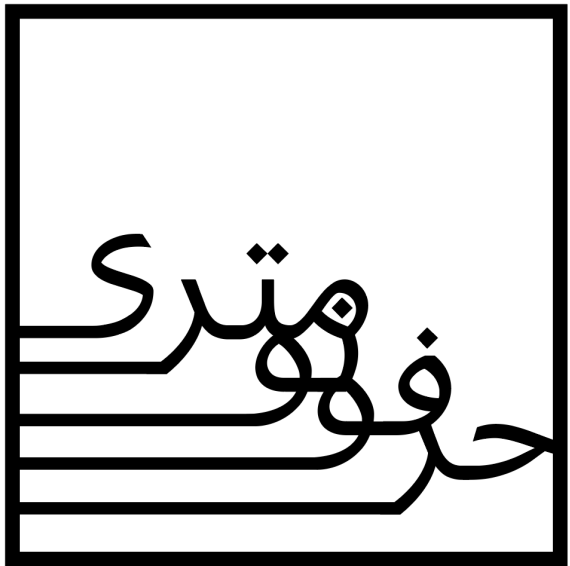
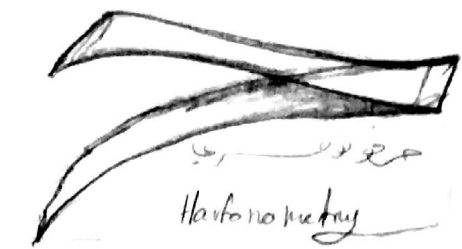




Figure.28
Layouts Sketches and experiments
(M. alThukair,2017)



Figures.28
Logo Sketches and experiments
(M. alThukair,2017)





Figures.29
Organized Workstation
(M. alThukair,2017)

09.Conclusion /Designer Reflection

Conclusion

This project intends to solve two relevant problems. The first problem was a lack of well-designed Arabic typefaces, while second was a scarcity of Arabic typography resources. The proposed solution is to provide an Arabic typography resource and publish it to the type designers encouraging them to design new typefaces on strong foundations derived from the rules of calligraphy. The process I followed was to look at calligraphy art assets, which is a rich field of information that has the history and background of how it was studied and refined, while there is a lack of information on computer typography, which led to the loss of aesthetics in the Arabic scripts.

Although there were appreciated efforts to mechanizing the Arabic type such as booklets produced from Khatt books, and documents for editorial type applications, however, all of these were from a technical point of view, and were still far away from character properties and its metrics. On another hand, there are books and manuscripts that described how to draw the letters and the metrics, but in calligraphy methods. This research is a mediator between these two sides, where designers stand.

The findings of my study were limited to one Arabic script, which is the Naskh script. There are five more scripts to study and derive the rules from, to achieve the goal completely as a future research. Also, while this study is first of its kind, it has a long journey to develop on other designers' and researchers' hands from different specialization that has typography in their fields such as Programmers and Computer scientists.

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11.Appendix

Introduction to literature review

The basics and standards of Arabic typeface design is based on the publications of senior calligraphers, anatomy of Arabic scripts, and other studies in the field. This review will not dig deep into the historical roots of lack of well-designed Arabic typefaces problem. Instead, it will discuss main concept of well-designed Arabic typeface, identify terminologies and collect information. In order to narrow this review down, it will only focus on Naskh script.

3.1 Arabic typography characteristic

Before discussing about Arabic typography and letters' details, some important characteristic of Arabic writing has to be defined:

- Arabic script direction is from right-to-left. (Moussaui, 2013).
- Arabic letters have 17 primary forms out of 28 letters, the rest of the letter forms are variations made by dots added above or below the letter.

The Arabic script is a joining script; Arabic characters have various forms depending on their placement in a word: initial, middle, final, and isolated except for six characters that join only to the preceding letter which eliminates it's forms into two forms: Isolated and final.

Arabic is a consonantal alphabet. Short vowels, are represented as diacritical marks –Harakat- and the text could be written with or without vocalization marks, it is left to the reader's familiarity with the language to be able to guess the vocalization of each word mentally. The diacritics position is above or below the letter. (Chahine, 2006; Moussaui, 2013)

3.1.1 The Different between Script and alphabet in Arabic

The two terms 'script' and 'alphabet' are often mixed up, so it makes sense here to point out the difference. The term 'alphabet' is used for the set of letters that indicate all the sounds of a spoken language. While the term 'script' refers to a writing system using a particular set of letters. In the case of Arabic, the script defines the connection between the individual letters, the baseline, the ligatures ...etc. In other words, the script sets down the rules about in what way the letters are allowed to be used. This difference between these two terms is much more clear for Arabic than for Latin. (Kampman, 2011)

3.2 The assets of designing Arabic typeface

This thesis intends to investigate in 'well-designed' Arabic typeface, which is a term that has to be defined clearly. Typography standards can be driven from calligraphy assets where it's a natural evolution in the written language. In calligraphy there are two levels to rectify and refine the script appearance. First one, the level of rectifying the letters, each letter in its own attribute. Ibn Muqla(940, as cited in Bahnassi, 1995) said

The letters need to rectify its forms for five things:

The letters need to rectify its forms for five things:

Interpolation (At-tawfiah: التوفية) That gives each letter its right amount

- of the lines that made up the letter: Arched, curved, and flat.

Consummation (Al-Etmam: الإتمام) to gives each letter its right amount of length, short, thin, or thicken.

- Completion (Alekmal: الإكمال) It is to give the character's body right of the properties in the straightness and flatness and tilt and lie down and
- curving. (ش.پ)

The fourth and fifth are 'Impregnation' and 'Transmission', and those are related to the way of handling the pen, which is not in the field of this review.

The second level is how calligrapher or designer combine and connect each letter to the following letter, and each word to the next word. According to Ibn Muqla(940, as cited in Bahnassi, 1995)

- Collocate ' Tarseef ترصيف ' : Connect each letter to next letter.
- Composite ' Ta'leef تأليف ' : Gather un connected letter to the next letter, on the best and perfect way.
- Delineate ' attastir التسطير ' :add a word to the next word to compose an orderly line.
- Tanseel ' التنصيل ' : The sites of recommended Kashida of connected letters. (خ.پ)

3.3 AlNaskh pen as a base of designing a typeface

Naskh calligraphy style was invented by: Ibn Muqla,Allababad (2013) says, Naskh calligraphy style is suitable for daily, fast, and reduct writing and is suitable for very small and large sizes usage. And Bahnassi (1995). These characteristics are essential needs in digital typographic applications. Bahnassi (1995) agreed with him.

3.3.1 Arabic script typographic levels

Zoghbi, (2016) pointed out that while Latin type anatomy has five levels: baseline, ascender, descender, x-height, and caps height, Arabic Naskh script may have five to twelve levels depending on the complexity of the typeface. This means that it is essential for Arabic type designers to possess expert knowledge of Arabic calligraphic styles and systems in order to be creative and to translate the calligraphic rules into typographic guidelines. The problem here is the type designer has to have an 'expert knowledge' which is the problem the thesis has to solve to fulfill the gap between designing well designed type face for beginners which necessarily means there is no sufficient experience in calligraphy nor in typography. The solution is to set a reasonable levels as a start, but also, the vertical levels method has its problems what will be discussed and solved later in this research.

3.3.2 The letters parameters.

There are several studies published about the art of Arabic calligraphy and treatise written by the calligraphers themselves, the most important treatise in Arabic calligraphy is ' Risala fi ilm alkhatt wa l-qalam' by Ibn Muqla (886-940 A.D.) which collected and documented in books as in (Bahnassi, 1995) and (Nājī, 2002). Others studied the anatomy of Arabic letters and specifications as (Gruendler, 1993). This research sums up of the most relevant information and parameters for each letter.

Five parameters have to be defined to analyze the characters efficiently: 'Basic form' used to describe the shapes or directions of the lines that compose the letter in isolated form and its relative size. 'Connection' Its occurrence, its location relative to previous or following characters, and how it affects the letter (shortening, adding, or changing of any of its parts), that includes its shapes in initial, middle and final form. 'Alignment' The spacing of the letter on the line and it's position relative to a physical or virtual base or base line. 'Style' Any feature may affect the character's shape, stylization of a character that could be written in other shape, or part of it.

'Diacritics' AbiFarès (2001) said there are two distinctive types of diacritics used, Dots and Vocalization marks. First one called 'diacritics dots', and come in configurations of one, two or three dots placed above or underneath existing letter forms to create complete new letters. The second kind of diacritics are the 'vocalization marks' used to mark short vowels and diphthongs, these vocalization marks are used to ease the understanding of the text and clarify the pronunciation of certain words. The amount of marks actually used in Arabic type vary vastly depending on purpose of the text.

3.4 Conclusion

The literature review discusses briefly the most important things that matters to the Arabic typeface's designers: characteristic of Arabic typography, levels of typography, parameter terms definition, asset of well-designed Arabic typography from calligraphic point of view and the reason behind choosing the Naskh script.

4. Research Methodology

The question starts from observing the problem, which is few well-designed Arabic typefaces have been created, even after all these years of using technology. Therefore, the survey was distributed randomly on Arabic designers, in order to know if the lack of comprehensive resources of Arabic typography is the main reason behind scarcity of well-designed Arabic typefaces or not. The designers were reached in their communities on social media and colleges of design in Arabic countries. The survey method has chosen where it quickly spread to a large number of people and differently answers of various backgrounds. After analyzing survey data, then the results confirm that lack of well-designed Arabic typefaces back on the lack of resources of Arabic typography, this research have to jump to the next step, which is trying to provide solutions by enriching the Arabic library. The Second method is a document analysis, the type of documents are articles written by senior calligrapher such as Ibn Muqla's letter ' Resalah Fi Elm Alkhatt Wa Alqalam' which considered one of most important of what had been written in Arabic calligraphy; a dictionary of Arabic calligraphy and calligrapher by Dr. Afif Bahnassi; and other papers and contemporary calligrapher and typographer websites. The information about letters' proportions in calligraphy; the ways of measuring letters; levels and basic lines; anatomy of the letters with all parameters was taken and tried to adapt them into digital-friendly guidelines.

After that, an experiment was conducted to test if the research may solve the main problem or not, through designing a new typeface by following the digitalized rules. Then, present the result to the typography teacher, other typographers, and designers. In order to take their feedbacks on the typeface's proportions, quality, and if its consider as a well-designed typeface or not. All of them agreed that it is a well-designed typeface except some minor issues.

6.1 Output/Evaluation

In conclusion, this research highlighted the main reason behind the scarcity of well-designed Arabic typefaces, which is the lack of comprehensive references. The following recommendations can help increase the number of well-designed Arabic typefaces:

- A reference book for designers.
- A typography course based on the new digital-friendly rules.
- A digital template of well-proportioned characters.

The following paragraphs will explain in detail these recommendations and their suggested method of evaluation.

One recommendation of the research is a reference book for designers because books are the most basic form of references. The book efficiency will be evaluated by conducting a case study on focus groups who don't know much about designing Arabic typefaces, they are just willing to learn and design. They will be observed in a specific area, classroom, in two phases. Phase one, they will be asked to design isolated forms characters (ا،ب،ج،د،و،س،ط،ن،هـ،ي). These letters are considered the building blocks for all other characters. Furthermore, the group will be asked to design initial form characters (كـ،فـ،جـ،ذـ،سـ); middle form (شـ،خـ،عـ،مـ،هـ); and final form (غـ،مـ،نـ،هـ،ي). Then ask them to generate a complete phrase with these forms. The reason behind asking them design letters separately then compose a word, instead of designing word from the begging, is to see how they will handle spaces between letters in the joining forms of the letters without giving any instructions, depending on previous knowledge they have.

Phase two they will be given the rules from the research (the basic content of the book), and ask them to do the same requirements with the same style of their typefaces, trying to make the participants depends completely on the printed instructions (the basic content of the book) without giving directions from the researcher, then see the results. From comparing the results from phase one and phase two, if there any the range of development will appear. Also, the time consumption before and after giving the instruction will be compared. The next stage is to make interviews with the participants about if the information in the references given is enough to design the requirements or not, what are the difficulties they were faced, and if they have any development suggestions to improve the content of the book.

The second suggested output is giving a course, it will be evaluated by a focused group, following the similar steps for previous output evaluation, except the second phase will be demonstrated as lectures and direct participant and answering their question if they will have.

Third suggested output is a digital template of well-proportioned characters, the designer will use it as a template and if he changes the shape of the curve, all curves following will change too, set the starts and ends shapes of characters, texture and style, and limited variate of the heights. This output will be evaluated by its primitive form, uploading Ai file with complete Arabic characters, and share it randomly with designers on the Internet and ask them to play with it and design their own typeface, then send survey to them asking if it is helpful or not, and asking for an image of their designed typefaces to see the range of variations between different designers, are the template will limits their creativity? or make the design process easier what would help generate more new typefaces.

Harfometry study of characters' measurements