Reshaping Visual Communication Design Curriculum to Support Collaboration with Computer Science and Engineering

Thesis

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By

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Abstract

Interaction design is an emerging field for visual communication designers. There has been a big demand for designers especially in Silicon Valley and in the software industry in general. In instances that I investigated, visual communication design curriculum has not been updated to teach students the interaction design skills they will need in their future jobs. To support this emerging area, visual communication design education needs to evolve into more technical and behavioral knowledge and less of artistic and manual skills.

One point that needs to be explored in academic settings is the collaboration with other disciplines. Since the software industry is the emerging field for visual communication designers, the collaboration with computer science and engineering is extremely important. There are misconceptions from both design and computer science students that can be demystified while they are still in college. The benefits from such collaboration will not only lead to a better understanding of professional practices, but it will also stimulate different ways of thinking and allow for students to start building their professional network.

After the analysis of visual communication design curricula from different programs in the United States, this thesis proposes changes to the current
curriculum at The Ohio State University, as a case study. Every curriculum in the country is different, but the recommendations to the Ohio State program can be adapted according to the needs at each school.

Instead of a proposal for the perfect curriculum, this thesis is a call to action for Design Departments to think about their mission, the future of the field of visual communication design, and how it is best situated in a growing collaborative environment.
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Thanks to my graduate colleagues at Ohio State, especially Aaron Ganci. Their excellence was truly inspiring.

And finally, thanks to my wonderful family, who have always encouraged me to go further.
Dedicated to my wife Ale.
Vita

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Publications

Collaboration between Computer Science Engineers and Visual
Communication Designers in Educational Settings.” Design Education for
Creativity and Business Innovation. Proc. of The 13th International
Conference on Engineering and Product Design Education, City University,

Stone, R. Brian, Lindsay Beach, Aaron Ganci, Taurean Jones, Bruno Ribeiro,
Emily Strouse, and Elise Woolley. “Immersive Learning: Developing an
Interactive Touch Screen Learning Module for Children with Autism.”


**Fields of Study**

Major Field: Industrial, Interior and Visual Communication Design
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Chapter 1

Introduction

I graduated from the *Escola Superior de Desenho Industrial* (ESDI), in Rio de Janeiro, Brazil, in December of 2002, with a degree in both visual communication and industrial design. During my last year at ESDI, I worked as a teaching assistant to Dr. Washington Dias Lessa in two of his classes, *Graphic Design Project Development I* and *Bi-Dimensional Structures and Color*. What was supposed to be only a short term job and a learning experience became a passion. When I graduated, I knew that teaching design was what I wanted to do.

Before endeavoring on a teaching career, I thought that it would be important to gain professional experience. That is how I started my professional practice, first in some design offices in the city and later in my own design office, Stijl, which was established in May of 2005. The office specialty was branding, therefore we worked a lot on logos. But we also designed a lot of websites, which was at the time the main piece of communication between most of the companies and their clients.

In 2009, there was an opportunity for me to pursue my Master of Fine Arts degree in the Design Department at The Ohio State University. I left Stijl and
moved to Columbus, Ohio, already planning on starting a teaching career in
design after graduating. In the autumn of 2009, I came to Ohio State interested
in learning more about branding and logos, because that was what I thought
I liked the most in visual communication design.

However, on November 19th, 2009, in my first term at Ohio State, I received
an email from Professor R. Brian Stone, inviting all the graduate students in
the Design Department to a brainstorming session around “forward thinking
ideas in the area of information systems and entertainment for automobile
interfaces”. This email ended with the sentence “Let’s think about and shape
the future.” After this meeting, I decided I did not want to study branding
and visual identities anymore. I decided I wanted to shape the future.
And the best way to start shaping the future would be studying the emerging
area of interaction design.

After becoming involved with projects in interaction design, I realized that I knew
very little about the subject, despite several years designing websites.
My undergraduate work did not prepare me to work with complex problems in
interaction design. I began to suspect that other programs would have this
deficiency as well. After talking to some colleagues and observing the
undergraduate students at Ohio State, I have come to the conclusion that they
have not been fully or adequately prepared to work on complex interaction design
problems either. Most of us had good skills in aesthetics and visual hierarchy.
What was missing was the ability to understand users’ needs and mental models of interaction with computers.

Since I wanted to become a full-time professor after graduating, it made even more sense to study the education of interaction design. That is how this thesis began. There could not be a better opportunity to shape the future than studying how to better prepare those who will be the future of visual communication design.

For this thesis, I have investigated what is missing from various programs, how to best integrate relevant interaction design concepts, and the ways we can deliver it to our students. One of the most important findings was the benefits of interdisciplinary collaborations, especially with programmers, to better prepare visual communication design students to work in the software industry. Ultimately, the research lead to a proposal for new curricula in visual communication design that would support collaboration with computer science.
Chapter 2

Activities, methods, and hypothesis

During my first year as a graduate student at The Ohio State University, I learned different methods of research, in classes with Professor Heike Goeller, Dr. Elizabeth B.-N. Sanders, Professor R. Brian Stone, and Professor Paul J. Nini. The methods consisted of online and offline surveys, heuristic reviews, task analysis, participatory design, among others.

Prior to my formal thesis research, I engaged in several tangentially related efforts and could apply some of those methods to obtain information about the field of software design. These projects informed my research and were primary discovery activities. The secondary research was based mostly on articles from conferences proceedings and online publications.

2.1. iShoe

The iShoe is an iOS application that makes it possible for Ohio State football fans at the Ohio Stadium (the “Horseshoe”) to enjoy up-to-the-minute statistics, player and coach biographies, and other “info-tainment” on Apple’s iPhone and iPod touch (Figure 1). This technology was first implemented at Purdue University, then transferred under license to Ohio State.
At Ohio State, the project was developed by Dr. Rajiv Ramnath, Thomas Lynch, and Christopher Dean, all from the Computer Science and Engineering Department, under the umbrella of CETI (CERCS for Enterprise Transformation and Innovation).

This project was my first interaction with the Computer Science and Engineering Department at Ohio State. During the Winter and Spring terms of 2010, I learned how to work with programmers, and could understand more about their skills.

During 2010, Professor R. Brian Stone and I collaborated with the team to conduct a heuristic review of the application, detailing the usability issues that we could find. On February 5th, 2010, we conducted a focus group session with six
football fans to understand what they would expect from an application of this scale. Professor Stone was the facilitator of this focus group.

After analyzing the findings from the focus group, the next step was to work on a flowchart to help developers design the application (Figure 2). This was the first step to approaching the functionality and workflow of the application.

Figure 2: iShoe flowchart
Then, every two weeks I had meetings with the developer lead, Christopher Dean, to make adjustments on the functionality and user interface (UI) of the application. I would usually delivery JPEG images with my concept of an ideal UI, and the developers would propose what would be their ideal interpretation of my design. Through this iterative process, we were both responsible for finding the best solution to fit the users’ needs in a reasonable timeline. Sometimes I had to make concessions, and sometimes he agreed to work more on his end trying to find a solution that would come closer to what I was proposing. When the application was done, we both agreed that we had learned a lot about the skills that each other’s disciplines could contribute to software development.

2.2. Nationwide User Experience Team overview

In the summer of 2010, I worked on a project with three other graduate students from the Design Department – Beth Benzenberg, Allen Cochran, and Aaron Ganci – on a project at the Nationwide Mutual Insurance Company User Experience Department.

This project consisted of an audit of their processes, team members, methodologies, and documentation. The goal of the project was to explain to new employees and potential clients what the User Experience Department can deliver and how it delivers it.
After 10 weeks of interviews with members of the team and internal clients at Nationwide, we wrote a report (Figure 3), with one page for each part of the process, specifying what role each member of the team is involved with in each phase of the project. Also, the report explained the documents in the process, and who were the team members that were either responsible or involved with them.

![Figure 3: Nationwide User Experience Team Overview book (interactive PDF)](image)

### 2.3. Cognitive Engineering Methods class

In the Summer term of 2010, I took a *Cognitive Engineering Methods* class (ISE 772) in the Industrial Systems Engineering department at Ohio State. This class was a project-based studio, taught by Dr. Phil Smith, and it was open to graduate and undergraduate students from different disciplines at the university. Working on projects with students from different backgrounds made me understand the importance of multidisciplinary work in academic settings. Each student brought different concerns, skills, and methods to the projects.
Industrial engineers, for example, demonstrate concerns that were very different than the computer scientists’ concerns. The main concern of industrial engineers was to make the product more efficient to the user. In some ways, it is similar to how designers work, without the ability to construct visual hierarchy.

2.4. Computer Science and Engineering capstone classes

In the Autumn term of 2010, I took two capstone classes in the Computer Science and Engineering department – *Software Engineering Project* (CSE 758), taught by Dr. Thomas Bihari, and *Web-Services-Based Distributed Systems Project* (CSE 762), taught by Dr. Igor Malkiman.

In each of those two classes, five groups of students developed projects proposed by real clients. “Examples of the projects included a math book for tablet computers, a sonar-based treadmill application, a GPS-based iPhone game, a visualization tool for gene mutations and their phenotypes, and a web-based development team management system.” (Ganci, 2011)

During this class, design graduate student Aaron Ganci and I were design consultants for the ten projects. Because of time constraints, we were not able to work closely with all the groups, however we were able to observe the process, and I could once again understand better the skills of a computer science student and the misconceptions around visual communication design. It was possible to
observe, though, that there was an appreciation by the CSE students for the user experience expertise that designers can bring to software development projects.

2.5. Interviews

In the winter of 2012, I interviewed professionals in the software industry, at Nationwide Insurance (Columbus, Ohio), about the necessary skills to work in the field. Professionals in a hiring position explained what they look for when they hire new employees. Other professionals explained what they knew and what they did not know before starting working in the industry. Also, they explained what classes they think that were helpful to the jobs they have today, and what classes they would like to have taken but they did not.

At Nationwide, the User Experience team is divided in three subteams: Usability Analysis, Information Architecture, and Visual Design. If you look at the job description for a usability analyst, it will describe someone with a background in psychology or human factors. However, there are people from design, engineering, business, and other fields working in this area at Nationwide. In the Information Architecture team, the typical background would be human-computer interaction or user experience programs. However, there are some visual communication designers and many industrial designers working in this area at Nationwide. In the Visual Design team, virtually everyone come from a visual communication or graphic design program. Many usability analysts and
information architects went to graduate school before working in the field. In the Visual Design team, a graduate degree seems to be rare.

Talking to professionals mostly from the Information Architecture and Visual Design teams, it was possible to notice different ideas about the field of Design. Coming mostly from Graphic Design programs in Art Departments, the visual designers valued very much their artistic background. According to them, that helps when working on the visual design of a web page. They all valued the basics of visual communication design as well. They unanimously said that the principles of typography, color theory, grids, balance, etc. in software or web design are similar to print design.

The information architects, on the other hand, did not value as much the craftsmanship classes they took. Most of them said that these classes taught them to pay attention to details and to think visually, but they agreed that other classes could be more important.

In all groups, almost everyone said that learning some coding is important when you are working in the field. Even if they do not code on the job, they need to have some understanding and appreciation for coding.

**2.6. Literature review**

The literature review was the starting point for this thesis. The article “Why Design Education Must Change”, by Donald Norman (2010) was a big inspiration
for this investigation. During the processes, other articles and books served as comparison to the collected data, and also motivation to explore different questions.

In the end of the process of writing this thesis, the literature review was important to validate some points that are brought here. Also, Chapter 3 is almost entirely based on “Uma Introdução à História do Design”, by Rafael Cardoso Denis, and on “Meggs’ History of Graphic Design”, by Philip B. Meggs and Alston W. Purvis. The chapter is a very brief summary of the history of visual communication design. Since it is not intended to bring a discussion about the history of visual communication design, but rather, to set a historical context, two very reliable sources were considered sufficient.

2.7. **Hypothesis**

After observation in professional and academic settings, supported by literature review, I was lead to believe that visual communication design education needed to change. I have come to the conclusion that visual communication design programs need to better integrate support to students who are graduating to work in the software industry. Also, I could notice evidence that this shift would require more collaboration with computer science.
Chapter 3

Historical context

It is difficult to precisely define when the history of visual communication design began. We could go back to the year 15000 B.C., when early Africans and Europeans were paintings in caves, or we can consider the years from 3100 B.C. to 2100 B.C., when pictographs evolved into the invention of writing. (Meggs, 2006: 4-7). The invention of the press around the year 1450, by Johann Gutenberg, in Mainz, Germany, was also an important milestone for the history of visual communications. The word “design”, however, was first registered only in the 17th century by the “Oxford English Dictionary”, and it was not until the beginning of the 19th century, with the Industrial Revolution in England, that it started to express a professional field (Denis, 2000: 17-18).

After the World War I, in 1919, the school Das Staatliche Bauhaus, in Weimar, Germany, was founded as a merger of the Grand Ducal School of Arts and Crafts and the Weimar Academy of Fine Art. It was moved twice, first to Dessau and later to Berlin, until it was closed, in 1933, when the Third Reich began. Faculty and students of the Bauhaus worked on furniture, architecture, product, and graphics (Figure 4), shaping a functional style and a modernist aesthetic that became characteristic of the school. During World War II, some of the most
important professors from the Bauhaus moved to the United States, influencing the way design is still taught in the country. (Denis, 2000: 118-123; Meggs, 2006: 310-319; Teasdale, 1998)

Figure 4: Bauhaus exhibition poster, designed by Joost Schmidt in 1923.

In the 1940s, Americans borrowed concepts from European immigrants and created their own approach to modernist design, applied mostly in magazines and advertisements produced in New York City (Figure 5 and 6). In the 1950s, American designers began to work for record labels and for the movie industry in California, creating album covers, posters, and animated titles for their motion pictures (Figures 7, 8, and 9).
Figure 5: Cover for the magazine Vogue, designed by Alexander Liberman in 1945

Figure 6: Poster for the 1939 New York World’s Fair, designed by Joseph Binder

Figure 7: Cover for the Kenny Dorham’s album “Round About Midnight at the Cafe Bohemia” designed by Reid Miles with photo by Francis Wolff (Blue Note Records, 1956)

Figure 8: Cover for the Bud Powell’s album “The Amazing Bud Powell” designed by John Hermansader with photo by Francis Wolff (Blue Note Records, 1956)
In the 1960s, for many designers in the United States, corporate identity systems became a major activity, and they were designing far beyond symbols and logotypes (Figures 10, 11, 12, and 13). In the 1970s, signage for international events, airports, and other transportation facilities became the new field to be highly explored by graphic designers (Figure 14). (Meggs, 2006: 374-423)
Figure 14: In 1975, Adrian Frutiger designed the typeface Frutiger for the Charles de Gaulle Airport directional sign system.

The era of digital design began in the 1980s, with Mac OS (Figure 15), in 1984, and Windows (Figure 16), in 1985. These two systems and the proliferation of personal computers (PCs) made the first mass market for graphic user interface (GUI) based computers (Hooper, 2007). In the mid-1990s, the proliferation of the commercial use of the Internet opened new possibilities for graphic designers. Visual communication designers began to explore the field of programming languages, such as HTML and ActionScript, creating new opportunities for themselves. Softwares like FrontPage (1995) and Dreamweaver (1997) helped designers develop websites with little or no knowledge of any programming language.
In the late 1990s and early 2000s, cell phone manufacturers, such as Nokia, Palm, and RIM, introduced their “smartphones” to the market. However, it was in 2008, when Apple opened their App Store for iPhone OS (now iOS), selling third party applications to the users, that the latest big field for designers began. Not only were visual communication designers and developers around the world...
designing applications to sell at Apple’s App Store (Figure 17), but also big companies were hiring designers and programmers to develop their applications for them.

Figure 17: Apple’s App Store
Chapter 4

Shift in the field

Throughout the 20th century, different possibilities for the graphic designer were created. From posters and magazines to graphic user interface, new fields were being added without affecting the fields existing before. In the 21st century, however, some of these areas began to disappear. Posters, for example, have become too expensive, in cost per person, when compared to other possible media. CD albums were replaced by digital files, during the first decade of the 21st century (Figure X).

Figure 18: U.S. Recorded Music Revenue. Source: Business Insider (DeGusta, 2011)
The proliferation of graphic production softwares, especially the Adobe Creative Suite, made it easy for amateurs to design books and logos, without the same quality, but marketable nonetheless. The site 99designs.com, for example, hosts design contests, where a company can “get a custom-made logo designed in less than 7 days, from $299”. Each of these contests receive an average of 100 submissions. While the practice of ‘spec work’ is controversial (Zinni, 2008; Airey, 2010), it does not seem to be illegal, therefore it will probably last as long as it is profitable.

The emerging field for visual communication design in the 21st century has been in the digital space. In 2010, “display advertising showed the fastest growth, with advertisers spending $10 billion dollars on video, banners, sponsorships and rich media ads. The category grew 24 percent compared to 2009.” (Vega, 2011)

In March of 2011, the Project for Excellence in Journalism reported that, for the first time in the United States, more people were getting their news from the web than from newspapers (Rosenstiel, 2011). The number of print copies sold by The New York Times has decreased very fast in this century and the digital copy has become their hope of being able to sell as many copies as they used to (Figure 19). With Apple launching iPad in 2010 and Amazon launching Kindle Fire in 2011, many of the most popular magazines, such as Sports Illustrated, The New Yorker, Esquire, and The Oprah Magazine, have transported their content to interactive applications made for these devices. In October of 2011, The Atlantic,
a 154-years old magazine, saw its digital advertising revenue exceeded its print advertising revenue for the first time (Peters, 2011).

![Figure 19: The New York Times Daily Circulation Data (Audit Bureau of Circulations Six-month Average). Source: http://www.nytco.com/investors/financials/nyt-circulation.html](image)

Meanwhile, the market for mobile applications has grown tremendously. In July of 2011, Apple announced that more than 15 billion apps had been downloaded, paying developers over $2.5 billion in three years. (Apple, 2011)

During the 2000s, websites became web services (Ganci, 2011). Beyond content consumption, users expected to interact more with websites, accomplishing tasks such as banking, consulting libraries, ordering pizza, making restaurant reservations, controlling their health, and shopping for books, music, movies, clothes, insurance, air tickets, etc. Such tasks are not trivial and they require the
design of the product to be thoroughly thought through to avoid frustrations or severe damage to the users.

To make all these activities possible on websites, traditional designers’ skills are not enough. In the software industry, developing web services, computer applications, or mobile applications, designers need to have a different skillset to work in interaction design. Interaction design is “the practice of designing interactive digital products, environments, systems, and services. Like many design disciplines, interaction design is concerned with form. However, first and foremost, interaction design focuses on something that traditional design disciplines do not often explore: the design of behavior.” (Cooper, 2007)

Figure 20: iTriage app for iOS. According to its website, itriagehealth.com, “iTriage is a new mobile and web healthcare platform, developed by two ER Physicians, that empowers people to make better healthcare decisions and improves healthcare delivery for providers and payers.”
Chapter 5

A new approach to visual communication design

Working with interaction design requires a revised approach to visual communication design. The approach can be compared, at some points, to how industrial designers traditionally find solutions to their problems.

The first aspect in which interaction design is similar to industrial design is on the seeking of problems. Graphic designers tend to respond to a demand from a client for a logo, a poster, a book cover, or a website. But they do not usually seek problems or ask how it would be possible to improve people’s lives through design. Seeking the problem in interaction design is important because only by understanding users’ needs is it possible to propose new projects in the software industry. That is how design gets away from being considered as a decorative tool in applications and becomes a key component of solutions and user experience.

A second aspect of interaction design that is similar to industrial design is the idea of functionality, that is much more concrete than in traditional visual communication design. According to Stone (2002), “The way we use a product is as important as what that product can do, or what it looks like, thus the issue of what an object means or causes one to do with it has moved to the foreground.”
The question “does it work?” when used in relation to a software application is much closer to how we think about tasters compared to how we think about posters. The functionality is less subjective and easier to be tested. Stone states that the similarities in design process are not restricted to interaction and industrial design, but also with interior design: “We embrace the syntactical ideas of physical product interfaces and tactile feedback, and translate these concepts into a screen-based solution, as well as the pragmatic aspects explored by interior space designers, (i.e. space planning, architecture, access, and egress) to develop clear, intuitive paths of navigation.”
Finally, visual communication designers need to get used to the idea of testing their products. Before being launched, applications need to be tested with real users. Industrial designers usually test their products for ergonomics, ease of use, etc. (Figure 24). In interaction design, usability tests, task analysis, and other structured research protocols can provide indispensable feedback to the designer. Graphic designers need to watch real users using their products to see if it really works as intended.

Figure 24: Tekscan Grip™ system being used to evaluate a baseball bat. Industrial design practices include ergonomic tests that visual communication designers are not too familiar with.
Chapter 6

Examples of current visual communication design curriculum in the United States

As a discipline with so many possible areas of work and different definitions, visual communication design has very different curricula in each program, in the United States and abroad. Each design school defines what skills should be emphasized during four or five years of undergraduate studies.

6.1. The Ohio State University

At The Ohio State University (public institution in Columbus, Ohio), the Design Department has three tracks: industrial, interior, and visual communication design. They are all four-year programs and grant degrees of Bachelor of Science in Design. As of 2012, all the students in the three tracks are required to take Introduction to Design, three classes of drawing, one class in color theory, two interdisciplinary studios of design basics (with students from the three tracks), and one class in design history. In the Spring term of their second year, students have their first classes that are specific to their concentration area. Among the required classes for the following two years of visual communication, there are six studios with emphases on different fields of work for visual communication designers, such as posters, packaging, logos, infographics, and signage. Other
required classes are *Design Methodology, Design Professional Practices*, and *Graphic Design Production*, with information on the preparation, administration, and development of printed matter. There are several elective courses being offered, including photography and interaction design studios.

### 6.2. University of Cincinnati

At the University of Cincinnati (public institution in Cincinnati, Ohio), students graduate, after five years, with a Bachelor of Science degree. The visual communication curriculum used to be divided into two separate programs: graphic design and digital design. However, for 2012, the School of Design has merged them into a new graphic communication design program. In their third year, students in this new merged program choose among three areas of concentration: print-based design, interaction design, and time-based design, which is the area of design that approaches solutions using video, motion graphics, and animation. According to the School of Design’s website, “the key educational objectives in the graphic communication design are aimed at creating effective communicators who have a user-centered design approach.”

In the first year, students at University of Cincinnati have foundation classes in drawing, 2D design, 3D design, design methods, design aesthetics, and typography. In the second year, there are required classes in photodesign, typography, design ideation, and kinetic communication. In the third year, before choosing what area they will focus on, all students in the new graphic
communication design program take classes in print design overview, time-based
design overview, and interaction design overview. In their fourth year, there are
specific studios in each of the three areas of focus, and classes in design
methodology, design history, interdisciplinary research methods, and
interdisciplinary global design issues. In the fifth year, students have one more
studio in their area of focus and a class in design methodology.

6.3. Arizona State University

Arizona State University (public institution in Tempe, Arizona) offers a four-year
graphic design program with a Bachelor of Science in Design degree. According
to their website, “the visual communication design program emphasizes
appropriate strategic communication through a design process that includes
research, analysis, conceptualization planning, and realization. This process leads
to innovative visual communication solutions for contemporary design problems
that are local to global in scope. Students integrate theory and method, culture
and context, environmental and human factors, traditional and contemporary
technologies, and visual aesthetics to develop comprehensive design strategies.
These strategies are applied to physical artifacts (books, brochures, packaging),
digital media (websites, CD-ROMs, video games, animation/film, kiosks,
interface), and environments (exhibits, sign systems). The objective is to provide
communication design strategies that inform, educate, direct, and communicate
effectively.” The website of Arizona State’s Design School also states that
“students interested in videography, production, cartoon design, illustration, styling, and photography should consult with the School of Art.”

Students in graphic design at Arizona State have two classes in principles for graphic design and two classes in graphic design history in their first year. During their second year, graphic design students have classes in drawing, letterform, typography, visual communication, introduction to psychology, and a required class in interaction design. In the third year, there are classes in social and behavioral sciences, natural science, introduction to art, technology for design, design rhetoric, and visual communication. During their fourth and last year, students take classes in cultural diversity, visual communication, motion graphics, and interaction design.

6.4. Carnegie Mellon University

At Carnegie Mellon University (public institution in Pittsburgh, Pennsylvania), students graduate with a Bachelor of Fine Arts in Communication Design after four years. According to their website, “through the four-year curriculum, students start with exploration of typographic form in space and time, and move on to study visual combinations of words and images, personal voice in visual communication, and finish with addressing problems of communicating complex information in both physical and digital environments.”
In their first year at Carnegie Mellon, students in both industrial and communication design have two design studios and classes in drawing, introduction to psychology, introduction to photo in design, critical histories across the arts, and world history. During the second year, students in the communication design track take classes in design history, basic typography, digital photo imaging, information organization, and a class in digital pre-press production. In their third year there are classes in complex typographic systems, advanced typographic systems and information design, beside design and non-design electives. In the senior year, students have a *Business of Design* class, more elective classes, and they work on their senior project. Students work in “individual projects or interdisciplinary team-based projects in communication design, product development, environments and spaces, or interaction design.”

6.5. **University of Illinois**

The University of Illinois (public institution in Champaign, Illinois) offers a degree of Bachelor of Fine Arts in Graphic Design and a degree of Bachelor of Fine Arts in New Media. In the new media program, according to the School of Art and Design’s website, “students and faculty work in sound, video, interactive media and web-based platforms to create performances, exhibitions, client-driven applications, and projects in public space.” According to the same website, the graphic design program “provides rich artistic training with clear professional value” and might prepare students for a wide range of jobs, such as “publication designer, website designer, multimedia designer, environmental designer,
consultant/freelancer, typographer, illustrator, teacher, studio artist, motion
graphic designer, project manager, and resources in graphic design.”

On their website, the School of Art and Design at the University of Illinois states
that “the curriculum in graphic design requires 122 credit hours and prepares the
student for entrance into the professional practice of design visual
communications. Studio work encompasses visual organization, typography,
image making, sequential design, production techniques, and the process of
communication planning. The first year of study provides a foundational base in
understanding design through the study of design history, typography, semiotics,
visual principles, and image making and meaning. The second year furthers these
studies through experimentation and development of methodological approaches
to design. The final year engages students in practical applications of design
through client-based projects that explore information design, visual systems,
publishing, and web and interactive design.” The required classes for the program
are *Introduction to Graphic Design, Design History Survey, Introduction to
Typography, Introduction to Image Making, Intermediate Graphic Design I,*
*Intermediate Graphic Design II, Advanced Graphic Design I,* and *Advanced
Graphic Design II.* Design electives include seven different classes in
photography, one seminar in design, and two classes in interactivity.

Also according to the website of the School of Art and Design at the University of
Illinois, “the curriculum in new media requires 122 credit hours. Students are
trained in the production and critique of works for art or design that explore forms and technologies identified as new or emerging. Students receive instruction in technical execution, formal composition, theoretical framing, and in the process of generating a body of work around a subject and form of their choice. Junior and senior years see students working on individually-guided projects, and work with critics across the school to develop a portfolio of work in time-based, interactive, physical networked or performative media.” The required classes during the program are New Media, Culture & Society, Time Arts I, Interactivity I, Time Arts II (taken twice), Interactivity II (taken twice), Advanced Seminar in New Media (taken twice), and Special Topics in New Media (also taken twice). Students also take classes in art foundation, art history, and design electives.

6.6. California College of the Arts

California College of the Arts (private institution in San Francisco, California) offers a BFA in Graphic Design and a new BFA in Interaction Design. In each of these tracks, students take four years to graduate. According to its website, the graphic design program “is both conceptual and skill based, emphasizing interdisciplinary thinking, theory, and rigor.” Another page on the website states that “CCA’s Interaction Design Program prepares students to create meaningful and innovative designed experiences in the realms of work, lifestyle, and play—from computers and mobile devices to interactive physical spaces, games, and social networks.”
In the first year of graphic design at California College of the Arts, students take four core studios, two elective studios, and two introduction to art classes. During the second year, there are two classes in graphic design, two classes in typography, and two classes in interaction. Also there is one class about the history of visual communication. In the third year, there are more classes in typography, graphic design, design studios, and an elective that can be chosen between motion graphics or letterpress. During their fourth year, students have an interdisciplinary studio, an investigative studio, and they work on their senior thesis. Throughout the four years, students also take several required non-design classes.

In the interaction design track, the first year is similar to the graphic design track, with four core studios, two elective studios, and two classes and introduction to arts. In their second year, students take two interaction design classes, a time studio, visual design, design research, and history of interaction design. During the third year, there are two interaction design classes, two time studios, and two interaction design interdisciplinary studios. During their final year, students work on their senior theses, take four studio classes, two of them in interaction design and one in an interdisciplinary studio.

6.7. Pratt Institute

Pratt Institute (private institution in Brooklyn, New York) offers a Bachelor of Fine Arts degree in Communications Design and a Bachelor of Fine Arts in
Digital Arts. According to its website, the communication design program “prepares students for the convergence of the design fields and for positions as creative directors and illustrators across a broad spectrum of increasingly media-based careers.” In the digital arts program, there are three possible areas of emphasis: interactive arts, 2D animation, and 3D animation & motion arts. In the interactive arts concentration, students “explore computer–human interaction to convey meaning in the form of physical installations, interactive objects and online artworks. This includes the combination of video, animation, text, audio and imagery in an interactive environment.”

In their first year at Pratt Institute, communications design students have classes in drawing, survey of art, color, 3D design, and 4D design. During the second year, there are classes in visual communication, design procedures, illustration, typographic design, and survey of art. In the third year, students take graphic design, typographic design, advertising, printmaking, package design, history of art/design, and film/video. During their fourth year, students work on their senior theses. Throughout the four years at Pratt Institute, students are required to have classes outside design, such as social studies, philosophy, mathematics, and world civilizations.

The first year of digital arts is similar to the communication design program. Students take classes in drawing, survey of art, color, 3D design, and 4D design. In their second year, students have classes in graphics programming,
3D computer modeling, interactive media, and credits in film or communications design. In the third year, students have elective studios and art history. During their senior year, students work on their senior projects and have elective studio classes. As in the communication design program, students also take classes outside design, such as social studies, philosophy, mathematics, and world civilizations throughout their four years of undergraduate studies.

6.8. Rhode Island School of Design

Rhode Island School of Design (private institution in Providence, Rhode Island) offers a four-year Bachelor of Fine Arts degree in graphic design. Its website provides a description of how the program is structured:

“[…] The core curriculum builds a range of analytical, formal, sensory and technical design experiences. Sophomores begin exploring visual principles of form, image, color and typography. Conceptual thinking in areas such as communication theory, visual systems and information design is the focus of the Junior year to develop a strong understanding of how visual communication can effectively express content, message, and information.

Typography is studied in depth throughout the program in an ongoing sequence of Typography courses that begin with history and anatomy of type, and examine principles of hierarchy and legibility at work within an individual letter form, to sentence, to paragraph, to page. Later on the
students work in expressive, experimental typography as well as time-based, interactive type in motion.

During the Senior year, emphasis is placed on design applications with core and elective courses to expose students to many specific areas of graphic design practice including environmental graphic design, poster design, design for publishing, identity design, web design and interactive information design. Seniors are offered an internship program over Winter session which allows them to work for credit either here or abroad. A challenging self-defined degree project is the final project in the program and one that taps into each student’s strengths, interests and experience.”

6.9. Cornell University

At Cornell University (private institution in Ithaca, New York), the Department of Design and Environmental Analysis awards a Bachelor of Science in three specialties: interior design, facilities planning and management, and human factors and ergonomics. In the human factors and ergonomics program, the focus is on how environments can support effective interactions with technologies. After graduating, many students work on software usability design.

During the four years of the program, students take classes in natural sciences, social sciences, humanities, written communications, and statistics. In humanities, there are classes in history of art and history of design. According to
its curriculum, “critical, historical, and theoretical studies of the arts and design are considered humanities. Languages and creative or performing arts such as the writing of fiction or poetry, painting, sculpting, designing, composing or performing music, acting, directing, and dance are not considered humanities.”

<table>
<thead>
<tr>
<th>Type of institution</th>
<th>Degree</th>
<th>Design tracks</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ohio State University</td>
<td>Public</td>
<td>B.Sc. Industrial, Interior, Visual Communication</td>
<td>4</td>
</tr>
<tr>
<td>University of Cincinnati</td>
<td>Public</td>
<td>B.Sc. Fashion, Graphic Communication, and Industrial</td>
<td>5</td>
</tr>
<tr>
<td>Carnegie Melon University</td>
<td>Public</td>
<td>BFA Communication Design, Industrial Design</td>
<td>4</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>Public</td>
<td>BFA Graphic Design, Industrial Design, New Media</td>
<td>4</td>
</tr>
<tr>
<td>California College of the Arts</td>
<td>Private</td>
<td>BFA Fashion, Graphic Design, Industrial, Interaction, Interior</td>
<td>4</td>
</tr>
<tr>
<td>Rhode Island School of Design</td>
<td>Private</td>
<td>BFA Apparel Design, Furniture Design, Graphic Design, Industrial Design</td>
<td>4</td>
</tr>
<tr>
<td>Cornell University</td>
<td>Private</td>
<td>B.Sc. Interior Design, Facilities Planning, Human Factors and Ergonomics</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1: Comparison of visual communication design programs.
Chapter 7

Collaboration with Computer Science in an educational setting

As described in Chapter 4, interaction design is the emerging field for visual communication design. Also, to solve more complex problems in the digital space, designers need to work closely to programmers in the software industry. According to Ganci, et al (2011), “by bringing together several disciplines, including computer science, user interface design, user experience design, cognitive engineering and graphic design, we can approach complex solutions more effectively at all levels.”

Historically, when designers work with print material, for example, they do not have to rely only on the experience and knowledge of the printer. Designers themselves are responsible for knowing the limitations and possibilities of each technology they are using. Designers would explore in print shops to get different results. This is not how it works in collaboration with computer science and engineering. Computer scientists and engineers are not service providers. They are part of the solution’s design. The process is different. Both designers and computer scientists are responsible for challenging each other to find the best solution for the user, with the best use of technology.
Therefore, the collaboration with other disciplines should begin before design students graduate to work in the industry. During their undergraduate studies in college, students should have a chance to work with students from other departments. In the case of visual communication design and computer science, it is very important because “there is a high level of misunderstanding between students in the two departments” (Herold, 2011). Herold explains the results from a questionnaire distributed to 33 undergraduate and graduate computer science students:

When asked to describe design in general, 47% of the students answered “look and feel” or “interface design”, and 52% answered “usability”. However, when asked to describe design within the context of software engineering, these types of responses dropped to 38% and 25% respectively; terms like architecture and software design (both 38%) rose in prevalence.

These preliminary questionnaires seem to point to a narrowing of vision among computer science students with regards to design. We believe the lack of interdisciplinary educational experiences blinds students to the expertise of their colleagues from differing fields.

Observing presentation posters from computer science and engineering capstone classes at Ohio State, it was particularly noticeable that many of the projects included usability improvements as next steps for the projects (Figures 25, 26,
27, and 28). If design students could participate in the process, proper usability design would have been present since the beginning.

Figure 25: Detail of the poster for the project “Natural Enemies Mobile Application”, CETI Industry Day, March 15th, 2012.

Figure 26: Detail of the poster for the project “Lexmark Mobile Document Capture and Enhancement Application”, CETI Industry Day, March 15th, 2012.

Figure 27: Detail of the poster for the project “Introdu”, CETI Industry Day, March 15th, 2012.

Figure 28: Detail of the poster for the project “Scarlet, Gray & Green”, CETI Industry Day, March 15th, 2012.
A studio with students from both disciplines is proposed in the article “Exploring Collaboration between Computer Science Engineers and Visual Communication Designers in Educational Settings” (Ganci, 2011). This studio class would be an immersive experience in which students would be able to share expertise and better understand each others’ skills. According to Stone (2011), “design and engineering have truly reached a point of convergence. With the growing complexity of project deliverables, expanding technologies, and more diverse and discriminating audiences, we’ve reached a point where collaboration through immersive experiences is required.”

Scudieri and Lilly explain that “in order for a design to be successful it must adeptly balance the many contextual factors – from performance requirements and market trends to the activity and environment of use – that defines a unique design problem” (Scudieri, 2011: 205). According to Scudieri and Lilly, “all product constraints can be viewed as a combination of five fundamental constraints categories. These fundamental categories are: physical, technological, market, social-cultural, and usage.” Writing about product design and the relationship between industrial design and engineering, Scudieri and Lilly claim that “in general, it appears that classically trained engineers will direct their attention to the physical and technological constraints, while industrial designers tend to focus on the cultural and usage constraints, with market constraints being a secondary focus for both groups.” Analogously, we can argue that graphic designers and computer science engineers tend to focus on similar constraints as
industrial designers and mechanical engineers, respectively. The difference is that, in digital products, the physical constraints can be translated to lines of code or time of processing.

Working in collaborative studio classes will help students from both disciplines understand the other constraints that they usually do not focus on. The goal of these studios is not to train students to learn skills from the other departments. Instead, the objective is to teach them appreciation for concerns that they might not have the necessary skills to deal with.

Aside from learning new ways to work on their discipline, a by-product of these collaborations would be the building of a professional network for the students. After graduating, students may choose not to work for an office or a company. They may choose to become an entrepreneur and start their own business, for example. If they want to start a company in the software industry, they will need programmers. The relationships built during academic collaboration can evolve into cases of success in future business.

7.1. Roles

According to “Developing Objected-Oriented Software” (IBM, 1997), a book that is currently used in the Computer Science and Engineering Department at The Ohio State University, the major roles in the object-oriented processes are the following: customer, planner, project manager, team leader, architect, analyst,
designer, domain expert, developer, information developer, human factors engineer, tester, and librarian.

“Designer”, in the book is described as:

*Responsible for the design of a subsystem or category of class. Directs implementation and manages interfaces to other subsystem.*

This is not the same use of the word “designer” as used in the design field.

However, there are three other roles that are related to what the activity of design as used in Design Departments is about:

*Architect: Responsible for overall design/architecture of the project. Manages the interfaces to other development activities related to this project.*

*Analyst: Takes the user requirements and generates project specifications. Interprets user intention and defines the problems that need to be solved. Responsible for developing domain analysis model with users and other team members.*

*Human Factor Engineer: Responsible for the usability of the product. Works with customers to ensure that user interface requirements are met.*

It is worth noticing that, in this book, there is no reference to aesthetic or visual style in any of the roles presented as related to software development. According
to Lidwell et al (2003), “aesthetic designs are perceived as easier to use than less-aesthetic designs”. Also, according to some of the interviews conducted for this thesis, the visual style of the product is part of the solution as much as technology, functions, and workflow of the software. Other interviewees would disagree and would add a visual style only after defining the functionality and each step of the interaction design. They were all unanimous, though, affirming that visual style is an important part of software development.

The value of the Design can be also noted in the Management Risk section of “Developing Objected-Oriented Software”:

Separating analysis from design: Addresses the risk of designing a solution for the wrong problem by allowing us to understand the user’s problem and its domain before we set out to create a solution.

Separation of user interface design from system design: Addresses the risk of creating a developer oriented (vs. user oriented) system and of letting the user interface get locked into the design by allowing us to involve experts (users and human factors) in an asynchronous cycle of user interface design and prototyping while the development team addresses design model and system environment issues. (IBM, 1997: 15)
Designers should not only advocate for the importance of visual style in software development, but should also demonstrate that they are trained to take other roles in the process.

7.2. Processes

According to the book “Developing Objected-Oriented Software” (IBM, 1997), “almost all projects [in software development] fall in the category of those requiring at least some incremental aspect and at least some iterative aspect” and “most projects have requirements that are uncertain and incomplete.”

Benzenberg (2011) describes two different Design processes, developed by Mavers (1970) and Lawson (1997) that are “cyclical throughout all of the major phases”. (Figures X and X)
The arrow between the Appraisal and Synthesis sub phases (...) indicates that a feedback loop is necessary. This accurately shows the process designers take in conceptualization and decision-making. Some argue that this loop is not the only one necessary. Certainly, as designers consider the implications of the decisions they are about to make, they can determine if additional research or analysis is needed, or that perhaps the synthesis of the idea could be performed in a different way. (Benzenberg, 2011: 26)
Lawson also argues that the process of moving from the abstract to the concrete may not be accurate. He puts the steps into a more iterative cycle (...), allowing a designer to move back and forth between each step at will, indicating that the creative decision-making process is not necessarily linear or sequential. (Benzenberg, 2011: 27)

Many disciplines related to design have processes that are similar. General design processes lead the project from large concept ultimately to detailed decisions through the Analysis – Synthesis process. This can happen over the life of the project, or on a smaller scale with every decision as discussed by Maver. The design process is also explored in a non-linear fashion, with phases being revisited or repeated throughout the project. (Benzenberg, 2011: 40-41)
Because of its iterative nature, the Agile methodologies, that have been largely adopted recently, seem to fit very well with both Computer Science and Design methods. According to Ganci et al (2011), “the recent adoption of Agile methodologies in the professional arena has helped the integration of multiple fields. (...) The design community is able to interface with the development team more closely in these environments, encouraging interdependency. These methodologies have been utilized successfully in recent years, especially when user input is essential.”

The conclusion from Scudieri and Lilly (2011), Ganci et al (2011), and Herold (2011), as discussed by Benzenberg (2011) and the IBM book, is that collaboration between design and computer science is not only desired but feasible, since the processes are similar.
Chapter 8

Proposed changes to visual communication design curriculum

According to the curricula analyzed in Chapter 6, concerning the proposed recommendations, it does not make much difference if the granted degree is a Bachelor of Science or a Bachelor of Fine Arts. Most of the Design programs have a strong component of art in their curricula. However, it seems to make sense for visual communication design to distantiate itself from the arts and focus more on other skills that designers should have.

While design focuses on how to serve the needs of a user, art is its own end (Brady, 1998). In design, the final product has to serve a final purpose. Ultimately, it will be judged on whether it does or does not do the job. The purpose of art can be huge or mundane, but usually the artists are to define their own constraints. In design, constraints are defined by other factors, such as budget, technology, timeline, market, and the use of the final product.

In some schools, such as University of Illinois, Pratt Institute, and The University of the Arts in Philadelphia, interaction design is in the same program as multimedia arts or digital animation. This is a misconception of what design and
arts should deliver. Designing a software application is completely different from making an animated movie. That is not to say that there is no place for time-based solutions in a Design program. Design can and should be using motion graphics if that is the best approach to convey a message. However, in digital animation programs, the product is a piece of art. To mix art and design in one program is to confuse the design students on what their professional role is.

Donald Norman (2010) wrote that “in educational institutions, industrial design is usually housed in schools of art or architecture (...). It is rare in design education to have course requirements in science, mathematics, technology, or the social sciences. As a result the skills of the designer are not well suited for modern times.” Norman goes further and advocates that “the old skills of drawing and sketching, forming and molding must be supplemented and in many cases, replaced, by skills in programming, interaction, and human cognition. Rapid prototyping and user testing are required, which also means some knowledge of the social and behavior sciences, of statistics, and of experimental design.”

Having some knowledge in these areas, however, does not mean that designers should be able to work in these fields. Instead, some appreciation for other areas can be gained during college experiences, by working with other departments. According to Scudieri and Lilly (2011: 209), “if we as educators modify curricula so that all of our students have at least some understanding of constraints that
are typically ‘outside the fence’, then our students are likely to leave the university much better prepared to confront real design challenges from their first day on the job.” Working with other disciplines, students gain appreciation for different parts of problems and solutions that are usually overlooked in their own fields. Visual Communication designers, for example, will understand better the physical and technological constraints of a project, which are usually overseen in their processes.

Few schools offer a studio in collaboration with other disciplines. But in those schools that do offer an interdisciplinary studio, it is usually an elective course, not a required one. At this time, with the job opportunities and entrepreneurship possibilities in the software industry, it is imperative that students in visual communication design have a better understanding of computer science, so they may engage in these activities. The technological constraints are an important part of the problem in software development, and designers do not have the skills to deal with them without programmers’ collaboration. Learning the implications of these constraints in the process of software design is only possible by immersive experiences.

### 8.1. Study case: The Ohio State University

To illustrate some possible changes in the current visual communication design curricula, a proposed new curriculum was developed for The Ohio State University’s program (Figures X and X). The program is four years long and it is
divided into ten-week quarters. All the required classes are offered in the Autumn, Winter, and Spring quarters of the academic years.

In the design program at Ohio State, although engaged in foundation lessons, students do not take any classes specific to their major (industrial, interior, or visual communication design) until the Spring quarter of their second year. That seems to be too late, at least in the visual communication track. First, because only when they start working on design problems are they able to better understand their career and evaluate if it is really for them. But also, and more importantly, if they do not start learning the specific visual communication design skills earlier in the process, they will still be learning basic skills during their third year, and will not be able to work on more complex problems, nor will they have a skill set to bear in collaboration efforts, until their last year in college.

In this proposed curriculum, the basics of visual communication design will begin in the first quarter of the second year. By the end of their second year, students would have much better visual communication skills, and they could start working on complex problems in the third year. In their fourth year in the program, students would be able to work on even more complex systems, including collaborative projects with other disciplines. Students need to learn basic and advanced skills in their fields before they start interacting with students from other fields, in multi-disciplinary collaborations.
## OSU Department of Design – Visual Communication Design Major current curriculum

### 1st year

<table>
<thead>
<tr>
<th>Autumn</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Design</td>
<td>Graphic Thinking for Designers</td>
<td>Drawing Systems for Designers</td>
</tr>
<tr>
<td>Descriptive and Analytic Drawing for Designers</td>
<td>Excursions in Mathematics (GEC)</td>
<td>Social Science (GEC)</td>
</tr>
<tr>
<td>English Composition (GEC)</td>
<td>Literature (GEC)</td>
<td>Natural Science (GEC)</td>
</tr>
<tr>
<td>Social Science (GEC)</td>
<td>Color and Communication</td>
<td>Electronic Media for the Designer</td>
</tr>
</tbody>
</table>

### 2nd Year

<table>
<thead>
<tr>
<th>Autumn</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Design I</td>
<td>Basic Design II</td>
<td>Basic VC Design Practices</td>
</tr>
<tr>
<td>Design History (GEC)</td>
<td>Introduction to Materials and Processes for Designers</td>
<td>Basic Typography</td>
</tr>
<tr>
<td>Introduction to Statistics (GEC)</td>
<td>Social Science (GEC)</td>
<td>Others or free electives</td>
</tr>
<tr>
<td>Introduction to Photography (GEC)</td>
<td>Others or free electives</td>
<td>Language, Identity and Culture, in the U.S Experience(GEC)</td>
</tr>
</tbody>
</table>

### 3rd Year

<table>
<thead>
<tr>
<th>Autumn</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo Graphics</td>
<td>VC Hand Graphics</td>
<td>Graphic Design Production</td>
</tr>
<tr>
<td>Design Methodology (GEC)</td>
<td>Natural Science (GEC)</td>
<td>Design Communication Practices</td>
</tr>
<tr>
<td>Others or free electives</td>
<td>Others or free electives</td>
<td>Others or free electives</td>
</tr>
</tbody>
</table>

### 4th Year

<table>
<thead>
<tr>
<th>Autumn</th>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Design I: VCD</td>
<td>Advanced Design II: VCD</td>
<td>Advanced Design III: VCD (Senior thesis)</td>
</tr>
<tr>
<td>Human and Environmental Systems Design</td>
<td>Design Professional Practices</td>
<td>History of Art or History (GEC)</td>
</tr>
<tr>
<td>Interactive VC: Strategies for Web Communication (suggested)</td>
<td>Interactive VC: Multimedia and Rich Media Design (suggested)</td>
<td>Natural Science (GEC)</td>
</tr>
<tr>
<td>Others or free electives</td>
<td>History of Western Art II: Europe and the United States, Renaissance to Modern (GEC)</td>
<td>Others or free electives</td>
</tr>
</tbody>
</table>

*Figure 31: OSU Department of Design – Visual communication design current curriculum*
OSU Department of Design – Visual Communication Design Major proposed curriculum

1st year

**Autumn**
- Introduction to Design
- Graphic Thinking for Designers
- English Composition (GEC)
- Color and Communication

**Winter**
- Drawing Systems for Designers
- Excursions in Mathematics (GEC)
- Social Science (GEC)
- Electronic Media for the Designer

**Spring**
- Basic Design
- Social Science (GEC)
- Natural Science (GEC)
- Design History (GEC)

2nd Year

**Autumn**
- Basic VC Design Practices
- Basic Typography
- Design Methodology (GEC)
- Introduction to Photography (GEC)

**Winter**
- Basic VC Design Practices II
- Introduction to Materials and Processes for VCD
- Social Science (GEC)
- Literature (GEC)

**Spring**
- Basic VC Design Practices III
- Introduction to Statistics (GEC)
- Photo Graphics
- Others or free electives

3rd Year

**Autumn**
- Intermediate Design I: VCD
- Design Research
- Natural Science (GEC)
- Others or free electives

**Winter**
- Intermediate Design II: VCD
- Interactive VC: Strategies for Web Communication (required)
- Human and Environmental Systems Design
- Others or free electives

**Spring**
- Intermediate Design III: VCD
- Design Communication Practices
- Interaction Design Production
- Others or free electives

4th Year

**Autumn**
- Advanced Design I: VCD
- Interactive VC: Multimedia and Rich Media Design (required)
- Others or free electives

**Winter**
- Advanced Design II: VCD
- Design Professional Practices
- Interdisciplinary Studio

**Spring**
- Advanced Design III: VCD (Senior thesis)
- Design Professional Practices
- Interdisciplinary Studio

*Classes that were moved*  *New classes*

Figure 32: OSU Department of Design – Visual communication design new proposed curriculum
Currently, in the first year of the program, there are three drawing classes. The first class, *Descriptive and Analytic Drawing for Designers*, is too focused on illustrations, and it is not as relevant to a visual communication designer as it may be to other designers (Figures 33 and 34). This class was removed and the other drawing classes were moved one quarter up. Then, *Graphic Thinking for Designers*, a class about visual thinking and perspective (Figure 35) was moved to the Autumn quarter, while *Drawing Systems for Designers* was moved to the Winter quarter of the first year. *Drawing Systems for Designers* has some aspects, such as technical drawing (Figure 37), that may not be too relevant to a visual communication designer. However, ruler-and-compass construction may be very valuable in a career in visual communication design. Even if designers use computers instead of actual rulers and compasses, the geometric relations between angles and lengths in a form are very important to create symbols (Figures 38 and 39).

*Figure 33: Examples from Descriptive and Analytic Drawing for Designers. (Cross-contour)*
Figure 34: Examples from Descriptive and Analytic Drawing for Designers. (Illustrations)

Figure 35: Examples from Graphic Thinking for Designers

Figure 36: Brazilian Central Bank’s logo and its building.
Figure 37: Examples from Drawing Systems for Designers (technical drawing)

Figure 38: Examples from Drawing Systems for Designers (ruler and compass construction)

Figure 39: Example of logo construction guidelines
The *Color and Communication* class was moved to the first quarter. This class is the fundamental of visual language, with not only color theory, but, more importantly, studies in contrast and semantics through colors. This class is a very good example of what visual communication designers will be dealing with throughout their careers (Figure 40), therefore it is beneficial to take it as soon as possible. To accommodate this class, a class in social science was moved to the second quarter of the first year.

![Figure 40: Example of an assignment in Color and Communication.](image)

In the Winter quarter of the first year, there is currently a class in literature that was moved to the second year to accommodate classes in foundations of Design.

The class *Electronic Media for the Designer* was moved into the literature class’s spot. It is a class where the students will learn the standard software applications for the industry. Nowadays, the Adobe Creative Suite (more specifically Photoshop, Illustrator, and InDesign) is taught in this class. But it may change in the future. It is arguable if software should be taught in a Design Department or if it should be students’ responsibility to learn it themselves. The class is,
nonetheless, a good opportunity to study visual language and basic aesthetic in the computer (Figures 41 and 42).

Figure 41: Electronic Media for the Designer example

Figure 42: Electronic Media for the Designer example. (Vectoring an image)
In the spots of *Electronic Media for the Designer* and *Drawing Systems for Designers*, two other classes will be offered. Both *Design History* and *Basic Design I* were moved from the Autumn quarter of the second year to the Spring quarter of the first year. *Basic Design I* is a class in exploration of forms to all the three tracks in the Design program at Ohio State (Industrial, Interior, and Visual Communication). It is better suited in the first year, where explorations are done, before students actually start working on design problems. *Basic Design II* was removed from the curriculum. The end of their first year would be the end of visual explorations. Therefore, *Basic Design I* would become *Basic Design*.

By the end of their first year, students should have acquired competence of visual composition and the use of color. Also, they should have understood some concepts of design, such as contrast, balance, and symmetry. Furthermore, they will have learned the Gestalt principles of perception and the proportions coming from the Golden ratio and the Fibonacci series.

In the first quarter of the second year, students would have classes that are currently taught in the Spring quarter. *Basic Typography* and *Basic Visual Communication Design Practices I* were moved to the Autumn quarter instead. The beginning of the second year is when they would already start working on design problems. *Basic Visual Communication Design Practices I* would be their first studio specific to visual communication design, while *Basic Typography* is one of the fundamentals of visual communication.
Another class that was brought to the first quarter of the second year was Design Methodology. This class is currently taught in the Autumn quarter of the third year, but it covers, as it is today, design research. With this proposed new curriculum, an actual class about design methodology would be taught as they would start working on their first design projects. The Introduction to Statistics class was moved from the Autumn to the Spring to make room for all of these classes.

In the Winter of the second year, students would have Basic Visual Communication Design Practices II and Introduction to Materials and Processes for Visual Communication Designers, as well as a social science class and a free elective. Basic Visual Communication Design Practices II would be another studio class, as a continuation of what was started in Basic Visual Communication Design Practices I.

Introduction to Materials and Processes for Visual Communication Designers would be a substitute for Introduction to Materials and Processes for Designers. This class is currently taught to all students in the design program – including industrial, interior, and visual communication. The new class would be offered only to visual communication students and it would cover the processes in the print industry as well as other materials and processes related to signage.

In the Spring quarter of the second year, students would take the new Basic Visual Communication Design Practices III. It would be a continuation of Basic
Visual Communication Design Practices I and II. The specific content of each of the three studio classes would depend on the expertise and preferences of each instructor. It would be expected, though, that, by the end of their second year, students have worked on book covers, posters, logos, and other simple projects in visual communication design.

Another courses that students would take in the Spring quarter of the second year is Photo Graphics, which according to Ohio State’s website is “an experimental workshop in techniques of manipulating existing images to create new visual ideas, emphasizing individual exploration; discussions and critiques.” This class is currently offered in the Autumn of third year, but it was moved one quarter up in this proposed model.

By the end of their third year, students should have strong typography and iconography skills. They will learn concepts such as visual hierarchy, legibility, readability, and alignment in the typography class. Also, during the Basic Visual Communication Design Practices series, they should refine their aesthetics and learn the basics of visual semantics and semiotics. In the Design Methods class, students should learn different ways to approach and plan a design project, including time management. They should also assimilate concepts such as iteration, evaluation, synthesis, and analysis.

In the Spring quarter of second year, students would also take Introduction to Statistics, which is currently offered in the Autumn of second year. This class is
specially valuable as a preparation for the *Design Research* class in the following Autumn quarter. The class *Language, Identity and Culture in the U.S. Experience* was removed from the curriculum for a lack of specific relevance to visual communication design students, but it could be taken as the free elective that is suggested for this last quarter of second year.

In the Autumn quarter of their third year, after taking *Introduction to Statistics* in the previous Spring, students would be prepared for the *Design Research* class. This class is currently offered to students in all three tracks – industrial, interior, and visual communication – in the Autumn of their third year, but it is labeled as *Design Methodology*.

In the first quarter of their third year, students would also take *Intermediate Visual Communication Design I*, a continuation of the *Basic Visual Communication Design Practices* series. In the third year, however, students are expected to deal with more complex problems than in their second year. A class in natural science and another free elective would be suggested for this quarter as well.

In the Winter quarter of their third year, students would take *Intermediate Visual Communication Design II* and two classes that are currently offered in the Autumn of their fourth year – *Human Environmental System Design* and *Interactive Visual Communication: Strategies for Web Communication*. *Human Environmental System Design*, according to the Ohio State’s website is an
“overview of the social/behavioral/physical nature of humans and their interaction with the environment as interpreted by the designer” and it is required to all majors in the Design Department.

The Interactive Visual Communication class is currently offered as a suggested elective, but it would become a required class to all visual communication design students. As stated in Chapter 4, interaction design is the emerging field for Visual Communication, and students cannot afford not to know it before graduating. This class would cover principles of interaction design, with focus on the web.

In the Winter quarter of their third year, a class named Visual Communication Hand Graphics is currently required. In this class, students explore the physical aspect of production, as opposed to working only in the computer. Students work with techniques such as letterpress and dye-cutting to achieve different outcomes. They also learn different kinds of bindings and use the skills to build mock-ups (Figure 43). This class has its values to increase appreciation for the production in print design. Its content, however is not as relevant to students as it used to be, so this class was removed from the curriculum in this proposal. It could, though, be offered as an elective.
In the Spring quarter of the third year students would take *Intermediate Visual Communication Design III*, *Design Communication Practices*, and *Interaction Design Production*. *Intermediate Visual Communication Design III* would be a continuation of *Intermediate Visual Communication Design I* and *II*. Again, the specific content of each of these three classes would depend on each instructor’s expertise and preferences. However, it is expected that by the end of their third year, students will have worked on more complex systems, such as visual identity, signage, information design, editorial projects, etc.

The class *Design Communication Practices* is, according to Ohio State’s website, “an overview of communication methods, techniques, and procedures utilized in
the various stages of the design process.” This class is currently offered in the
Spring quarter of the third year and it did not move in this proposed model.

Also currently offered in the Spring quarter of the third year is Graphic Design
Production, a class about “fundamental information on the preparation,
administration, and development of printed matter used by the visual
communication designer.” This class was removed from the curriculum, with its
content being covered in Introduction to Materials and Processes for Visual
Communication Designers, in the Winter of their second year. In its place,
Interaction Design Production would be offered, a class on the current
interaction design tools, such as HTML, CSS, etc. The content of this class would
evolve with the standards in the industry.

Having worked on more complex problems during their third year, students will
have acquired more advanced skills to work on elaborated systems. Examples of
concepts that they will learn are consistency, entry point, wayfinding, and
storytelling, among others. Also, during their Interactive Visual Communication
class, they will learn concepts specific to interaction design, such as affordance,
error recover, feedback, the flexibility-usability trade-off, Fitts’ law, Hick’s law,
etc. In their Design Research class, students will learn to seek the problems and
to discover the users’ needs, through different methods.

In their fourth year, students will learn about professional practices and to think
holistically about the field of design. They will learn about the roles that design
and designers play in the different industries and markets. Having mastered all the basic skills of design, it will be in the last year that they will work with other disciplines in collaborative activities.

In the Autumn of their fourth year, students would take Advanced Visual Communication Design I, a continuation of the Intermediate Visual Communication Design series. In the fourth year, however, in the Advanced Visual Communication Design series, students would be expected to work on even more complex problems, including projects in interaction design systems and self-proposed problems, using the skills learned in the Design Research class.

Another class in the first quarter of their last year would be Interactive Visual Communication: Multimedia and Rich Media Design. This class would cover the principles of Interaction Design, but its focus would be beyond websites, dealing with other products in the software industry, such as applications for computers, kiosks, telephones, tablet computers, television sets, etc (Figure 44). This class would be a preparation for the Interdisciplinary Studio in the following quarter.
In the Winter quarter, students would take *Advanced Visual Communication Design II, Design Professional Practices*, and a new *Interdisciplinary Studio* class. *Design Professional Practices* is an “investigation of the administrative and legal aspects of the design profession contrasting the private firm with corporate and free-lance types of practice” and it is currently offered in the Winter quarter. It would not move in this proposal.

The new *Interdisciplinary Studio* would be a class in collaboration with the Computer Science and Engineering (CSE) Department. The two capstone classes in the CSE Department are project-based, with students working on real projects in a total of ten groups of four or five students. Each of these groups would work
with two Design students in the process proposed by Ganci et al (2011), described in the figure 45.

![Diagram of the process](#)

**Figure 45: From Ganci et al (2011)**

From the last two quarters of the current curriculum, three classes were removed – *History of Western Art II, History of Art*, and *Natural Science*. These classes were considered to be not as relevant to students as having more time to work on the *Interdisciplinary Studio* and their senior thesis.

Then, in the last quarter of the last year, students would take only *Advanced Visual Communication Design III*, which would be their senior thesis, a self-proposed project, where students would demonstrate their ability to work on complex problems in visual communication design.
Chapter 9

Conclusion

My expectation after finishing this study is that changes are necessary and can be realistically applied in visual communication design education. I have come to the conclusion that design needs to be more about planning, and systematic and behavioral thinking, and less about manual skills.

Much has been said about the need and importance of designers in Silicon Valley as decision makers. My proposal is in support of this underserved market. When working in the software industry with professionals with different backgrounds, such as computer scientists, designers need to be able to conceptualize products in collaboration to be perceived as peers by their co-workers and collaborators.

As Alan Cooper, widely known as the “Father of Visual Basic”, said in a recent Twitter post, “Engineers don’t build bridges. Ironworkers do. Engineers draw pictures and make calculations about bridges.” (Figure 46) (Cooper, 2011) The same can be applied to designers. If we educate our students with craftsmanship skills, they will be like ironworkers in the process. They will be primarily executing, instead of focused on planning.
Aesthetics will always be part of the designers’ work, because it is part of the user experience. However, as my advisor at Ohio State, Professor R. Brian Stone, always says, “when we start arguing with our clients what shade of green is more beautiful, we are in trouble”. As Mattos (2011) points out, designers need to be less subjective and biased on their discussions:

Applied science can be a great help if they still want to have large impact. It is important to start applying methods that address concern of bias, replication, and disclosure of the problem and findings. This way, designers can stop being seen as merely creators of “pretty things”, and start presenting their findings as something that will be well respected not only by designers, but also by the Scientific community. It is not and will not be easy to make use of all the constraints science requires, but it is essential that designers understand the issues when researching human behavior. (Mattos, 2011: 34)

If we want to be perceived as decision makers it is imperative that we stop creating our own “original and personal styles” and become more skilled
in finding out and demonstrating what is more effective from the users’ point of view.

With the collaboration activities and the curriculum changes proposed in this thesis, students would develop a more holistic view of the professional world, especially related to software development and mobile apps. Also, collaborating with other disciplines’ students will stimulate different ways of thinking, which is a benefit unto itself, not to mention the professional advantage it may provide later in their careers. Discussions with other disciplines during the college years tend to enrich the learning experience of the students.

There is a potential for this to have success if design were to realign itself with engineering, formally or informally. That would enable spontaneous interaction between people in the different areas and would decrease the bureaucratic hurdles that hinder interdisciplinary collaboration. These interdisciplinary academic activities are not only desired but feasible, as described on Chapter 7. The primary benefit would be the professional understanding of each other’s field. The secondary benefit would be the acquaintance between students from design and computer science, that can be evolved into professional networks to the point that it can even generate coherent working relationships or entrepreneurial initiatives.

It is time for Design Departments to analyze their alumni and the jobs they are going into, and compare this with the content that is being taught in their
respective design programs. We should always be revisiting what is the mission of
the professional field of design and compare with the mission of the institution in
which it is inserted. Each department, then, will be able to clearly establish their
mission. Considering the mission of each program, departments can make
informed decisions about the students they want to attract and about the content
that students should learn while they are in school.

While developing new curricula, it is not enough to understand the current
state of the field. Professors need to predict the near future of the field. It is
important to learn from the past, but one of the lessons that we have learned
from the past is that we need to leave behind what is not relevant anymore.
We learn and evolve.

However, changes are never easy to implement. Even when the consent is that
some changes need to occur, it is difficult to find an agreement on which is the
most appropriate direction to go. Leaving artistic skills in favor of technical and
behavioral skills is a big change for the design field. Design professors may see
the changes as a threat to their expertise, for example. Even students may
consider the changes a threat to their creativity.

I believe, however, that these changes may benefit the visual communication
design programs around the United States. Students will be more prepared to
work in the field and, therefore, be more marketable. Also, visual communication
design is still sometimes perceived as a superfluous or cosmetic activity. These changes may increase the value of the entire field.

9.1. Next steps

The first next step for this research would be to implement and evaluate these changes in selected design schools in the United States. However, before changing curricula, departments would need to define their mission and goals. This should then be mapped to an educational theory, such as Bloom’s taxonomy (Bloom, 1956). Only with its goals in perspective, will a department be able to interview their alumni to assess if the skills they have learned in school are relevant and effective.

Curriculum developers should examine their new proposed curriculum to see if it matches each institution’s policies for the number of credits, amount of humanities classes, such as English and math, and other possible constraints. Also, new curricula should be compared to the policies of accrediting organizations, such as the National Association of Schools of Art and Design (NASAD).

Furthermore, collaboration with other disciplines should be investigated. In the software industry, designers will work with people from various backgrounds and not only computer science. Academic collaboration with business,
communication, English, and other types of engineering can be very beneficial to design students as well.
Bibliography


