

CS3650: Visual Languages and Visual Programming

Instructor: [Prof. S. K. Chang](#)

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Time and Classroom: TuTh 6pm - 7:15pm SQ6516

Course Description: There has been growing research and applications in visual languages and visual programming. Its applications are diverse: big data visualization, data mining, visual analytics, visual user interface, visual specifications, visual reasoning, visual database systems and multimedia computing, to name but a few. This course will prepare the student to pursue research in these new and exciting fields of visual computation theory and application of visual languages and visualization tools such as PEGASUS and GraphLab.

This course is one of the [graduate courses in software engineering](#). This course covers the fundamentals of visual language theory, iconic and symbolic representations, parsing techniques, semantics and pragmatics of visual languages, visual programming systems, visual querying systems, visual information systems and visual software engineering.

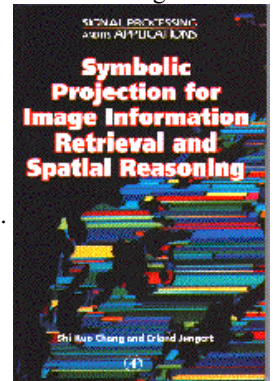
Course Outline: An [introductory lecture](#) provides the background, theory and application of visual languages. See also the [Calendar](#).

Prerequisites: The student is expected to be familiar with programming languages, operating systems, and has some knowledge of computer graphics and compiler design.

Class Notes: Class notes and selected papers will be provided to the class. The notes will be available on the Web.

Reference Books and Journals:

- (1) Principles of Visual Programming Systems, S. K. Chang (Ed.), Prentice Hall, 1990 (ISBN 0-13-710765-X).
- (2) Principles of Pictorial Information System Design, S. K. Chang, Prentice Hall, 1989 (ISBN 0-13-710195-3).
- (3) Visual Languages and Visual Programming, S. K. Chang (Ed.), Plenum Publishing Company, 1990.
- (4) Journal of Visual Languages and Computing, Academic Press, recent issues.
- (5) S. K. Chang and E. Jungert, Symbolic Projection for Image Information Retrieval and Spatial Reasoning, Academic Press, 1996 (ISBN 0-12-168030-4).



Tools: You will need to download the following tools.

- The zip file of Virtual Classroom 4.0 can be downloaded at: <http://www.cs.pitt.edu/~chang/cvc/Download/zipfile/vcstu40.zip>. More information about VC, user manuals and other tools can be found at: <http://www.cs.pitt.edu/~chang/cvc/>.

Grading:

The student is expected to complete four milestones (20%), take one midterm (25%), give one seminar based upon selected papers and technical reports (15%), and do a project and make a project presentation/demonstration (40%). [Grades](#) can be found on-line. A [bulletin board](#) is available for interaction among students and the instructor.

Term Project: We will focus on the virtual classroom as a general theme. Then a topic can be chosen based upon your interest: (a) Implementation of visual interface, visual database and visual programming tools for the virtual classroom. (b) Theoretical topics related to the syntactic and semantic theory of icons, active indexing, the theory of visual languages. (c) Visual specification and transformations for rapid prototyping.

Unique Features of this course: We will use the Web extensively for this course. The class notes will be available on the Web. The exercises and take-home mid-term examination are also available on the Web. Students are encouraged to turn in exercises, mid-term examination by e-mail, give the seminar by developing a Web-based visual/multimedia presentation, and give the project demo/presentation the same way. There will also be a single project theme: the **virtual classroom**. More details about the virtual classroom will be provided in class.

Note: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.