Course Outline of Visual Languages and Visual Programming

Instructor: **Prof. S. K. Chang**

Date Topic Reading
(All dates are tentative and subject to changes)
Week-1 Visual computing and visual languages (Chapter 0)
Week-1 Generalized icons (Chapter 1)
Week-2 Iconic visual languages (Chapter 1)
Week-2 Sentient Map (notes)
Week-3 Spatial relations (Symbolic Projections, Chapter 2), Exercise 1
Week-3 Spatial relations with application to image information retrieval Chapter 4 (S_Chapter 4, SP_Chapter 5, SP_Chapter 6)
Week-4 syntactic analysis (The invisible operator, Chapter 3)
Week-4 syntactic analysis (A visual language compiler, Chapter 3), Exercise 2
Week-5 semantic analysis of visual sentences Methodology for Iconic Language Design
Week-5 visual design, software visualization visual design process
Week-6 spatial reasoning Chapter 5 (SP_Chapter 10), Exercise 3
Week-6 spatial reasoning applications Chapter 5 (SP_Chapter 10), brainstorming
Week-7 Visual programming by active index SP_Chapter 12, Exercise 4
Week-7 Active index SP_Chapter 12, Active index paper
Week-8 Tele-action objects and TAOML Visual languages for Tele-Action Objects
Week-8 Visual programming Brainstorming
[Talk about Prograph, other visual programming language here]
Week-9 Take-home Exam handed out
Week-9 visual queries SP_Chapter 11
Week-10 multiparadigmatic database Reality Bites, Exercise 5 and Sample Solution
Week-10 Web-at-a-Glance brainstorming
Week-11 Active multimedia system Management of TAOs
Week-11 Active multimedia system Transformation and Exchange of TAOs
Week-12 Active multimedia system SP_Chapter 13-15, brainstorming
Week-12 no class
Week-13 Seminars guidelines and Projects Presentations
Week-14 Seminars and Projects Presentations
Week-14 Project Due

Reading Materials are: (The SP_Chapters are from the Symbolic Projection book. Other materials on online)

Chapter 0 Introduction (based upon S. K. Chang, "Elements of a Visual Language", IEEE Software Magazine, Vol. 4, No. 1, January 1987, 29-39)

Chapter 1 Iconic Visual Languages (based upon "Visual Languages: A Tutorial and Survey", IEEE Software Magazine, Vol. 4, No. 1, January 1987, 29-39)

Chapter 2 Symbolic Projections (based upon Chapters 1 and 3 of the book by S. K. Chang and E. Jungert, *Image Information Retrieval and Spatial Reasoning*, Academic Press, 1996)

Chapter 3 Syntactic Analysis of Visual Sentences (based upon S. K. Chang, "A Visual Language Compiler for Information Retrieval by Visual Reasoning", IEEE Transactions on Software Engineering, Special Section on Visual Programming, 1990, 1136-1149)

Chapter 4 Spatial Relations

Chapter 5 Spatial Reasoning

S. K. Chang, "Extending Visual Languages for Multimedia" , IEEE Multimedia Magazine, Fall 1996, Vol. 3, No. 3, 18-26.

S. K. Chang, S. Orefice, M. Tucci and G. Polese, "A Methodology and Interactive Environment for Iconic Language Design" , the International Journal of Human-Computer Studies (IJHCS), 41, 1994, 683-716.

S. K. Chang, W. Hua and C. W. Yoo, "Visual Abstraction in the Visual Design Process" , Proc. of 1997 Conf. on Software Eng. and Knowledge Eng., Madrid, Spain, June 18-20, 1997.

S. K. Chang, "Towards a Theory of Active Index" , Journal of Visual Languages and Computing, Vol. 6, No. 1, March 1995, 101-118.

S. K. Chang, M. F. Costable, S. Levialdi, "Reality Bites - Progressive Querying and Result Visualization in Logical and Visual

Spaces" , 1994 IEEE Symposium on Visual Languages, St. Louis, October 4-7, 1994, 100-109.

H. Chang, S. K. Chang, T. Hou and A. Hsu, "The Management and Applications of Tele-Action Objects" , ACM Journal of Multimedia Systems, Springer Verlag, Volume 3, Issue 5-6, 1995, 204-216.

C. C. Lin, S. K. Chang and J. X. Xiang, "Transformation and Exchange of Multimedia Objects in Distributed Multimedia Systems" , ACM Journal of Multimedia Systems, Springer Verlag, Volume 4, Issue 1, 1996, 12-29.

S. K. Chang, "Fusion of Geospatial Information" , Technical Report, Visual Computer Laboratory, University of Pittsburgh, May 1, 1997.

T. Catarci, S. K. Chang, L. B. Dong and G. Santucci, "A Prototype Web-at-A-Glance System for Intelligent Information Retrieval" , Proc. of 1997 Conf. on Software Eng. and Knowledge Eng., Madrid, Spain, June 18-20, 1997 (see the experimental WAG system).

S. K. Chang, D. Graupe, K. Hasegawa and H. Kordylewski, "An Active Medical Information System for Information Retrieval, Discovery and Fusion"

S. K. Chang, G. Costagliola, E. Jungert, "Querying Multimedia Data Sources and Databases", 1999 (The Sigma query is also included in the presentation on information fusion.)