

Rubric (Spring 2011)

Senior Project

**Assessment of Student Outcomes of the BS in Computer Science
of the
School of Computing and Information Sciences
Florida International University**

The School of Computing and Information Sciences evaluates the Senior Projects of its graduating seniors for the purpose of assessing the level of attainment of the Student Outcomes of the BS in Computer Science program.

Your responses to this survey will be used solely for the purpose of assessing the Student Outcomes of the BS in Computer Science program of the School of Computing and Information Sciences at FIU. This survey is expressly NOT for assessment of student performance in the SCIS Senior Project course for assignment of letter grade, nor for assessment of the instructor(s).

Rating Instructions

For each program outcome, you are provided with a check-list of 7 or more criteria that evidence attainment of that outcome. Please check all criteria that are presented in this project. You may include additional criteria that are not explicitly listed; if so, please record the additional criteria in the spaces provided. Unless noted otherwise, the number of criteria checked, up to a maximum of 5, should be recorded as your rating of attainment of that outcome evidenced in the project.

Project Title ____ Data Visualization for Large-Scale Network Simulation ____

Semester & Year ____Spring 2011____

Faculty / Industry Sponsor: __Jason Liu_____

Evaluators: _____ Jason Liu _____

Student Outcome (a): Demonstrate proficiency in the foundation areas of Computer Science including mathematics, discrete structures, logic and the theory of algorithms

- 3 Project incorporates elements of mathematical reasoning or proof
(**e.g.** Lemma, Theorem, Propositional Logic, First Order Logic, Mathematical Induction)
- 3 Project utilizes elements of discrete mathematics
(**e.g.** Set Theory, Boolean Algebras, Combinatorics, Graph Theory)
- 5 Project utilizes some statistical procedure(s) to represent or summarize test data
(**e.g.** Mean, Standard Deviation, Stem Plot/Histogram, Box Plot/Percentile-Graph)
- 5 Project utilizes some statistical measure(s) of system behavior or performance
(**e.g.** Probability Distributions, Confidence Intervals, Hypothesis Testing)
- 5 Project design utilizes finite state diagrams to model system behavior
- 5 Project utilizes some aspect(s) of formal computer science
(**e.g.** Automata, Turing Machines, Recursive Function Theory, Recursive Unsolvability)
- 1 Project utilizes some technique(s) of numerical analysis
(**e.g.** Error Estimation, Interpolation, Numerical Calculus, Linear Systems, Matrix Algebra)

 OTHER: _____

 OTHER: _____

Student Outcome (b): Demonstrate proficiency in various areas of Computer Science including data structures and algorithms, concepts of programming languages and computer systems.

Data Structures & Algorithms

- _5___ Project utilizes an advanced data structure, (**e.g.** search tree, hash table, priority queue)
- _3___ Project utilizes some graph algorithm, (**e.g.** shortest path, minimum spanning tree)
- _5___ Project documents runtime analysis of selected algorithms

Concepts of Programming Languages

- _1___ Project utilizes knowledge of programming language syntax
(**e.g.** Context-Free Grammars, Parse Trees, Ambiguity, Recursive Descent)
- _1___ Project utilizes knowledge of programming language semantics
(**e.g.** Natural Semantics, Interpreters, Expressions, L- and R- Value, Environments)
- _1___ Project demonstrates familiarity with programming language design issues
(**e.g.** Scoping Rules, Dynamic Type Checking, Static Type Checking)

Computer Systems (Database)

- _1___ Project utilizes or designs an appropriate database management system
- _1___ Project utilizes conceptual and/or relational schema
- _1___ Project utilizes a database query language such as SQL

Computer Systems (Operating Systems)

- _3___ Project implementation utilizes knowledge of memory management
- _5___ Project implementation utilizes knowledge of process synchronization
- _5___ Project documents analysis of tradeoffs in selection of system characteristics

____ OTHER: _____

____ OTHER: _____

Student Outcome (c): Demonstrate proficiency in problem solving and application of software engineering techniques.

_5___ Project demonstrates knowledge of the Software Development Life Cycle

_5___ Project deliverables include Project Specification

_5___ Project deliverables include Feasibility Study and/or Project Plan

_5___ Project deliverables include Requirements Documentation

_5___ Project deliverables include Design Documentation

_5___ Project documents testing and/or evaluation of the implementation

_5___ Project incorporates system walkthroughs

___ OTHER: _____

___ OTHER: _____

Student Outcome (d): Demonstrate mastery of at least one modern programming language and proficiency in at least one other.

- _5___ Project is implemented using an appropriate high level language
- _5___ Project implementation is reasonably efficient rather than “brute force”
- _5___ Project implementation is modular and/or re-usable
- _5___ Project implementation uses a modern API or Tool-Kit
- _3___ Project implementation utilizes recursion
- _3___ Project implementation utilizes some advanced features, e.g. polymorphism
- _3___ A project sub-system or module utilizes an appropriate programming language other than the primary implementation language, e.g. SQL, ML, assembly language

___ OTHER: _____

___ OTHER: _____

Student Outcome (e): Demonstrate understanding of the social and ethical concerns of the practicing computer scientist

_5___ Project documents sources and references

_3___ Project identifies and addresses any relevant social issues

_3___ Project identifies and addresses any relevant ethical issues

_4___ Project identifies and addresses relevant legal issues

_3___ Project identifies and addresses any relevant privacy issues

_5___ Project documents anticipated impact on users/clients

_4___ Project documents and addresses any anticipated technology impact issues

_____ OTHER: _____

_____ OTHER: _____

Student Outcome (f): Demonstrate the ability to work cooperatively in teams

_5___ Project completion evidences equitable participation by team members

_5___ Project presentation(s) included all team members

_5___ Project team activity is documented

_5___ Project team set out and followed a schedule for timely completion

_5___ Project team negotiated consensus when needed

_5___ Team members roles were clearly defined and executed

_5___ Team members shared responsibility for success and failure

_____ OTHER: _____

_____ OTHER: _____

Program Outcome (g): Demonstrate effective communication skills

- _5___ Presentations described the essential features of the project
- _5___ Presentations utilized good quality slides and presentation aids
- _5___ Presenters utilized their time effectively
- _5___ Presenters spoke directly to the audience
- _5___ Technical features were communicated clearly
- _5___ Project artifacts clearly document all project features
- _5___ Project reports are well organized and written

____ OTHER: _____

____ OTHER: _____

Program Outcome (j): Have experience with contemporary environments and tools necessary for the practice of computing

_5___ Project utilized contemporary design tools

_5___ Project implementation utilized a modern IDE(s)

_5___ Project utilized appropriate validation/testing tools

_5___ Project was demonstrated using appropriate presentation tools

_5___ Project utilized appropriate project management tools (e.g., MS Project)

_5___ Project utilizes appropriate version control/document sharing tools

_5___ Project documents consideration of trade-offs in selection of tools

_____ OTHER: _____

_____ OTHER: _____

ABET Student Outcome

The program must enable students to attain, by the time of graduation:

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]

Please comment on how this project “demonstrates comprehension of the tradeoffs involved in design choices”:

The project involves complex design of analyzing and presenting network data from data source to graphs on the screen. The design must take into consideration functional as well as performance concerns and create effective methods to streamline data.