<u>**Check-List**</u>

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.

To assist the evaluators, the project team is asked to identify aspects of the project related to the various Student Outcomes. For each Student Outcome, a checklist of 4 typical project features related to the outcome is provided. There is no requirement or expectation that any particular feature must be present in your particular project. Nor is the checklist exhaustive. Please add to the lists any additional features of your project that relate to any of the Student Outcomes.

For each checklist item represented in your project, please document where that item is evidenced in your project by noting the **deliverable** (*Feasibility Study*, *Requirements Specification*, *Design Document* or *Final Document*) and **section** or **page number**.

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).

Project Title <u>Data Visualization for Large-Scale Network Simulators</u>

Semester & Year ____*Spring 2011*_____

Moderator (Faculty / Industry Sponsor): <u>Dr. Jason Liu</u>
Team Members: <u>Douglas Otstott</u>   <u>William Bissett</u>

<u>Roni Kirchheimer</u>   <u>Joel Guilarte</u>

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

_____ Project incorporates elements of mathematical reasoning or proof
(**e.g.** Lemma, Theorem, Propositional Logic, First Order Logic, Mathematical Induction)

_____

_____ Project utilizes elements of discrete mathematics
(**e.g.** Set Theory, Boolean Algebras, Combinatorics, Graph Theory)

_____

X Project utilizes some statistical procedure(s) to represent or summarize test data
(**e.g.** Mean, Standard Deviation, Stem Plot/Histogram, Box Plot/Percentile-Graph)

Simple Moving Average Algorithm: Deliverable 3 Pg. 12

_____ Project utilizes some statistical measure(s) of system behavior or performance
(**e.g.** Probability Distributions, Confidence Intervals, Hypothesis Testing)

_____

X Project design utilizes finite state diagrams to model system behavior

Statechart Diagrams: Deliverable 3 Pg.11-12

X Project utilizes some aspect(s) of formal computer science
(**e.g.** Automata, Turing Machines, Recursive Function Theory, Recursive Unsolvability)

Statechart Diagrams: Deliverable 3 Pg.11-12

_____ Project utilizes some technique(s) of numerical analysis
(**e.g.** Error Estimation, Interpolation, Numerical Calculus, Linear Systems, Matrix Algebra)

_____

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

X   Project utilizes an advanced data structure, (**e.g.** search tree, hash table, priority queue)

        TimeSeriesDataPipe: Deliverable 4 Pg.27

____   Project utilizes some graph algorithm, (**e.g.** shortest path, minimum spanning tree)

_____

X   Project documents runtime analysis of selected algorithms

        Analysis of Moving Average Algorithm: Deliverable 3 Pg. 12

Concepts of Programming Languages

____   Project utilizes knowledge of programming language syntax
(**e.g.** Context-Free Grammars, Parse Trees, Ambiguity, Recursive Descent)

_____

____   Project utilizes knowledge of programming language semantics
(**e.g.** Natural Semantics, Interpreters, Expressions, L- and R- Value, Environments)

_____

____   Project demonstrates familiarity with programming language design issues
(**e.g.** Scoping Rules, Dynamic Type Checking, Static Type Checking)

_____

Computer Systems (Database)

____   Project utilizes or designs an appropriate database management system

_____

____   Project utilizes conceptual and/or relational schema

_____

____   Project utilizes a database query language such as SQL

_____

Computer Systems (Operating Systems)

_____   Project implementation utilizes knowledge of memory management

_____

X   Project implementation utilizes knowledge of process synchronization

Thread Synchronization : Deliverable 4 Chapter 5

X   Project documents analysis of tradeoffs in selection of system characteristics

Blocking vs. Busy-waiting: Deliverable 4 Section 6.2

OTHER: _____

_____

OTHER: _____

_____

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

X   Project demonstrates knowledge of the Software Development Life Cycle

      Deliverable 4 Section 1.3

X   Project deliverables include Project Specification

      Deliverables 1-4: Problem Definition, Current System, Scope of System

X   Project deliverables include Feasibility Study and/or Project Plan

      Deliverable 1: Chapter 2 & 3

X   Project deliverables include Requirements Documentation

      Deliverable 2

X   Project deliverables include Design Documentation

      Deliverable 3

X   Project documents testing and/or evaluation of the implementation

      Deliverable 4: Chapter 6 and Appendix D

X   Project incorporates system walkthroughs

      User Manual: Examples

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

X   Project is implemented using an appropriate high level language

        Deliverable 4: Appendix C (Javadoc)

X   Project implementation is reasonably efficient rather than "brute force"

        Simple Moving Average implementation: Deliverable 3 Pg. 12

X   Project implementation is modular and/or re-usable

        Deliverable 4: Chapter 5

X   Project implementation uses a modern API or Tool-Kit

        Deliverable 4: Section 2.2

_____   Project implementation utilizes recursion

_____

_____   Project implementation utilizes some advanced features, e.g. polymorphism

_____

_____   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*

X   Project documents sources and references

       Deliverable 1-4: References

____   Project identifies and addresses any relevant social issues

_____

____   Project identifies and addresses any relevant ethical issues

_____

X   Project identifies and addresses relevant legal issues

       Deliverable 4: Copyright and Trademarks

____   Project identifies and addresses any relevant privacy issues

_____

____   Project documents anticipated impact on users/clients

_____

____   Project documents and addresses any anticipated technology impact issues

_____

OTHER: _____

_____

OTHER: _____

_____

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

<u>X</u> Project completion evidences equitable participation by team members

   <u>Delieverables 1-4: Project Organization Chapter</u>

<u>X</u> Project presentation(s) included all team members

_____

<u>X</u> Project team activity is documented

   <u>Deliverable 1-3: Diary of Meetings</u>

<u>X</u> Project team set out and followed a schedule for timely completion

   <u>Deliverable 4: Appendix A</u>

<u>X</u> Project team negotiated consensus when needed

   <u>Deliverable 1-3: Diary of Meetings</u>

<u>X</u> Team members roles were clearly defined and executed

   <u>Deliverable 1-4: Project Organization</u>

<u>X</u> Team members shared responsibility for success and failure

_____

OTHER: _____

_____

OTHER: _____

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

X   Project utilized contemporary design tools

      StarUML File

X   Project implementation utilized a modern IDE(s)

      Eclipse Project Folder

____   Project utilized appropriate validation/testing tools

_____

X   Project was demonstrated using appropriate presentation tools

      PowerPoint: Presentations 1-4

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

      Deliverable 4: Appendix A

X   Project utilizes appropriate version control/document sharing tools

      Subclipse: SVN on Mentor's Server

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

      Deliverable 1: Chapter 2

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]

<u>Please comment on how this project "</u>*demonstrates comprehension of the tradeoffs involved in design choices"*: