CENTER FOR ADVANCED DISTRIBUTED SYSTEM ENGINEERING

PART I: MISSION, ORGANIZATION ISSUES, TRENDS, DIRECTIONS, AND GOALS

A. MISSION AND AREAS OF FOCUS

CADSE's mission is to establish a streamlined research, technology exploration and advanced education program in the areas of foundation of software engineering, distributed and internet-based computing, software architecture, object-oriented technology, software testing, and software reuse. The Center's R&D cover both theoretical and practical aspects of distributed software engineering, i.e. using engineering methods and technologies to tackle development problems of complex, reliable, and/or real-time distributed systems. The center's goal is to become a truly national known research center in the above areas in the next three years.

B. ORGANIZATIONAL ISSUES, EXTERNAL TRENDS AND STRATEGIC DIRECTIONS

1. ORGANIZATIONAL ISSUES

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<td>Director</td>
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<th>Hong Zhu</th>
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2. ADVISORY BOARD
None.

3. EXTERNAL TRENDS

What external trends may influence your programs or operations over the next five years?
Government funding to the Center's research areas is expected to maintain the same level. The Center's research topics are expected to play a more important role in computer science. We expect to place substantially more emphasis to integrate basic research with technology transfer and dual-use technologies.

How do you intend on adjusting to these?
1) To become nationally competitive by research excellence and through recruiting key center members...
To create a more sustainable organization structure to handle expected Center growth.
To take a balanced and coordinated approach towards basic research, applied research and technology transfer
To establish stable and organized collaboration with other universities, industry and government agencies.

4. STRATEGIC DIRECTIONS AND AREAS OF EMPHASIS

Provide a vision of your unit in five years from now. Include strategic directions and special areas of emphasis in which you expect to be known for excellence. Specify the University Academic Themes that these pursue.

1) 35 - 55 members in the Center with a balanced distribution among FIU faculty members (5 – 7), visiting professors (2 – 3), post-doctoral or senior research associates (3 – 5), graduate students (20 – 30) and advanced undergraduate students (5 – 10).
2) Annual research funding of $750,000 - $1,000,000 from Federal agencies and industry.
3) Extended scale of R&D operations in foundation of software engineering, software architecture, software agents, software security, object-oriented technology, software testing, and software reuse. These are expected to be among the key growth areas in both government and industry sectors.
4) Establish an inter-organization R&D consortium comprised of members from several universities, industry and government agencies in multiple, complementary disciplines.
5) Expand operations in application R&D and technology transfer in defense systems, healthcare, transportation through government and industry grants and contracts.

C. 2000-2001 ANNUAL ACCOMPLISHMENTS

Goal 1: To help further enhance FIU’s Carnegie Doctoral Research Extensive Status (Addresses University Goal V – Ranking /Research I)

Assessment Criteria (Measurable Outcome): measure progress by continued success in receiving federal research funding and produce Ph.D. students
Accomplishment: Received $250,000 funding from the NSF CREST program, $29,013 from the NSF International Program, and $97,000 from NASA during 2000-2001. Directed 7 Ph.D. students with one passed qualifying examinations.
Use of Results for Program Improvement: The research funding enabled us to produce high-quality publications, support large number of Ph.D. candidates, and invite leading researchers from other universities. The above activities have laid the foundation for our future successes for obtaining research funding and producing Ph.D. graduates.

Goal 2: To become a true nationally competitive research center (Address University Goal IV – Strategic Themes)

Assessment Criteria (Measurable Outcome):
   a) Submit 3 well-focused quality research grant proposals to federal agencies;
   b) Sustain $550,000 in Federal research funding;
   c) Publish a decent number of high quality research papers
Accomplishment:
   a) submitted two research proposals and completed two more to be submitted;
   b) received over $350,000 in 2000-2001 with $350,000 more to be received in 2002-2003;
   c) published 9 journal papers and more than 15 refereed conference papers.

Use of Results for Program Improvement:
The above accomplishments have greatly enhanced our center’s visibility and status nationally and internationally and
laid the foundation for our future

**Goal 3: Applied Problem Solving (Addresses University Goal III).**

**Assessment Criteria (Measurable Outcome):**
- a) Apply our research results to both government (NASA) and industry problems and publish the results;
- b) Establish collaborative research relationships with software companies.

**Accomplishment:**
- a) We have developed a software architecture specification and verification methodology that has the potential application for NASA software development;
- b) We have obtained research results to make the software industry standard object-oriented development language UML more precise, which will help produce more reliable software systems.

**Use of Results for Program Improvement:**
The above results serve as the basis for real-world application.

**Goal 4: Research and Creative Activities (Addresses University Goal II).**

**Assessment Criteria (Measurable Outcome):**
To publish high-quality original research results

**Accomplishment:**
We have published 9 journal papers and more than 15 refereed conference papers during 2000-2001.

**Use of Results for Program Improvement:**
The above results open up many more research problems and potential solutions for our continued research.

**D. 2001-2002 Annual Goals**

2001-2002 Goal 1: Research and Creative Activities (University Major Goals: G II)
Measurable Outcome: Continue to publish high-quality peer-reviewed journal and conference papers

2001-2002 Goal 2: Applied Problem Solving (University Major Goals: G III)
Measurable Outcome: Apply our research results to real-world problems

2001-2002 Goal 3: Strategic Themes (University Major Goals: G IV)
Measurable Outcome:
- a) Publish high-quality papers
- b) Collaborate leading researchers at other universities

2001-2002 Goal 4: Ranking / Research I (University Major Goals: G V)
Measurable Outcome:
- a) Submit several competitive proposals to federal agencies
- b) Supervise more Ph.D. students towards their graduation
E. EXECUTIVE SUMMARY

1. Major Activities – Prior Year

   Overall our center has had a very good year. We have rebuilt our center due to the departure of Dr. Yi Deng and several post-doctoral research associates.

   a. Scholarly Activities: Dr. He traveled to four international conferences to present the research results and served as program committee members for three major international conferences. We have hosted the visits of several internationally known researchers from University of Texas at Dallas, University of Illinois at Chicago, University of Florida, and Oxford Brookes University in U.K.

   b. Published Research: we have published 9 journal articles and more than 15 refereed conference papers.

   c. External funding: we have secured more than $350,000 federal funding from the NSF and NASA.

2. Activities – Coming Year

   We are very excited about our center’s research in the coming year. We have successfully recruited Dr. Hong Zhu, an internationally known expert on software testing. We also hired a very strong senior research associate Dr. Huiqun Yu who was a full professor at a good Chinese university. We have nearly 10 Ph.D. students, several of whom will take the Ph.D. qualifying exams and have produced preliminary research results.

   a. Proposed Research: we will continue publishing high-quality papers.

   b. Teaching and Training Activities: we are involving our senior Ph.D. students in our sponsored research projects.

   c. Service and Outreach: we will continue to serve on program committees and to review manuscripts for professional publications. We will continue our active collaboration with researchers around the world.

   d. Opportunities for Students: the center and the school will continue to support about 10 Ph.D. students and several M.S. students. We will submit several research proposals and secure future funding to support these students.