1. **Host Welcome** – Bruce Lenell, Northrop Grumman

2. **Introduction of Attendees**

3. **Biennial ISTeC “FutureVisions” Symposium** – Pete Seel, ISTeC EAC Member

   Announcement of the SP10 (March 2010) FutureVisions Symposium. This full day symposium is designed to provide a look into the near future (2010-2020) of information science and technology (IS&T) - to give CSU students and other conference attendees a better understanding of cutting-edge and high-growth areas in the field. Request to IAC for:

   a) suggestions for speakers from their companies; ideas for topics

      i) IT Management Issues related to Cloud Computing; security, privacy, private vs public (Sy Nayman – Rogue Wave); companies that already have or are using Cloud Computing (K. Joel Accenture?); information and infrastructure in Cloud Computing (D. George); Dan Reed (Microsoft) to talk about Azure; Amazon, Google?; Ethics, privacy in Cloud


      iii) HCI

      iv) Kamen and DEKA arm (medical applications)

      v) IT (Information Technology) – ET (Energy Technology)

   b) volunteers to serve on conference organizing committee – sign-up sheet was circulated

4. **Host Member Presentation** – Bruce Lenell and Richard Wallace, Northrop Grumman

   Company overview of Northrop Grumman, focusing on Colorado operations.

5. **Front Range High Performance Affinity Group** – Pat Burns, ISTeC Executive Committee, CSU VP for Information Technology

   ISTeC is exploring organizing an affinity group for the use of high performance computing, which might focus on advanced HPC architectures, algorithms, and applications. We need to know what the IAC members think such a group should do, how it should be structured, and which companies are interested in participating.

6. **Annual ISTeC High School Day** – Michael De Miranda, Professor, School of Education and Dept. of Electrical and Computer Engineering

   2009 High School Day will be October 2009 (specific date TBA). This full day event held at CSU will gather a planned 400 high school students, advisors, and teachers from across Colorado to introduce the best and brightest students to information science and technology (IS&T) career paths and educational opportunities at CSU by providing students with interaction with representatives from Colorado’s leading high
tech corporations, and IS&T based demonstrations and contests devised by CSU faculty. This year we will be working with Colorado MESA (Math, Engineering, Science Achievement) to present our program. Solicited IAC input on how to improve the event and how to best get the involvement of their companies for attracting the best students to the IS&T Colorado workforce. Requested sponsorship commitments. Henry Dittmer will coordinate IAC involvement.

7. **Member Presentation** – Jim Alexander, Tandberg Television
   Company overview of Tandberg Television, focusing on Colorado operations.

8. **Overview of CSU Continuing Education Programs Related to Information Science and Technology (IS&T)** – Carl Melle, Continuing Education
   Overview of the IS&T related courses provided by CSU Continuing Education, focusing on issues addressing the needs of the IAC companies and the people the IAC represents, both from the company point of view and from the "individual who may be laid off" point of view.
   - Is there a degree completion program at CSU – Global for CIS? Not currently, but being worked on.

9. **Continuing Education Programs Offered by the College of Business** – Cap Smith, ISTeC EAC Member
   a. Masters Programs: day time on-campus MS CIS (Computer Information Systems), night time on-campus MBA, night time; off-campus MBA, and night time Denver Executive MBA.
   b. Undergraduate programs: daytime on-campus BS CIS, and CSU Global online degree completion program.

10. **Continuing Education Programs Offered by the Computer Science Dept.** – Darrell Whitley, Computer Science Dept. Chair
    a. How is required lab work performed? Coordinated with instructor on CSU resources or resources supplied by student

11. **Systems Engineering Program Offered by the College of Engineering** – Tony Maciejewski, Electrical and Computer Engineering Dept. Head
   Summary of the existing M.E. in Systems Engineering program.
   Planned M.S. and Ph.D. in Systems Engineering with Energy Systems emphasis.

12. **Industry Panel:**
    **How Good Are CSU Continuing Education Programs Related to Information Science and Technology (IS&T)?**
    In this time of cutbacks, where people are changing their roles to preserve their jobs, expanding their roles because of others being laid off, or looking for new positions because they have been laid off, we feel this panel and the presentations from CSU that will precede it are quite important. The panel will discuss their reactions to the CSU continuing education offerings related to IS&T offerings.
Panelists:

a. Su Hawk, CSIA

Surveyed IT company to get ideas of need; Agility – capability to update or re-evaluate information more often; hot jobs = integration of IT and business capability; smaller companies need employees who are very broad in capability – IT knowledge as well as business skills; TEAM WORK, PROJECT MANAGEMENT, CULTURE, INNOVATION, ADAPTABLE.

b. Paddy Heywood, IBM

Looking at how people are at risk to increase their value to the company (to minimize chances of being laid off); people who are selected for RIF how they can make themselves marketable; distance learning used to grow in your job; Connect can create isolationism with the process – need interaction with the instructor; asynchronous capability is very important to busy people.

c. Joan Mitchell, InfoPrint

Strong proponent of distance education but interaction also very important; learning about corporate culture very important; need to know the politics of a company; companies need to accommodate students who have learned, educated or grown out of their jobs.

d. Doug Prom, Innovate

Employees need to know life cycle processes – but also team skills; sales, dealing/communicating with customers.

e. Carl Jamison, Raytheon

Raytheon is very closed environment; has spoken to co-workers and they are very positive about the Adobe Connect capability; still need to work out a couple bugs; Class in corporate politics is needed. Preparation for growth in their careers.

Panel Questions:

a. How well do these offerings address the needs of your company for keeping your employees up-to-date? What needs to be added or changed?

b. How well do these offerings address the needs of your company for educating new employees? What needs to be added or changed?

c. Will these offerings be helpful for employees who roles have been modified or expanded? What needs to be added or changed?

d. Will these offerings be helpful for strengthening employees to help ensure their positions in your company? What needs to be added or changed?

e. Will these offerings be helpful for employees who will be laid off to find new positions? What needs to be added or changed?

- Cap Smith indicated that the MBA at CSU covers many of the issues of politics, culture, environments.
- Org chart defines specific delineations – actuality is usually quite different. Need to learn the actual processes of the company politics (Nayman)
- Need to ask the right questions? Where can I make the biggest difference?
Encouraging social network communications.
Are you forward thinking enough?
How can we use social networking for business solutions?
  o Need to make sure social networking applies appropriately to your company – needs to be updated constantly
Format of education not necessary the problem – going with the “tribe” – popular capabilities – figure out a way to use the popular format at the time to teach and learn; how can these technologies be used in a corporate environment?
Why is CSU unique when teaching through distance – what makes us special?
  o Reputation of the educator who is actually teaching the class
  o Need to promote CSU’s reputation – high class education that people don’t know about
  o CSU students have higher incoming requirements = higher outgoing levels

13. Joan Mitchell announced she is retiring in June.

14. Fall 2009 IAC Meeting Agenda Ideas – H. J. Siegel, ISTeC Director
Suggestions for agenda items for our next ISTeC IAC meeting; request for host company.
  a. Ericsson guys (J. Alexander)
  b. Collaboration tools
    i. Twitter – how can it be used in a corporate environment
    ii. Corporate WIKI? (Northop Grumman)
       1. Make it work – prevent it from ‘splatting’?
    iii. Second Life
    iv. Social networking as a learning tool
    v. Cap Smith – virtual world
The FutureVisions Symposium at CSU on the Future of Information and Communication Technology

A biennial conference sponsored by ISTeC with support from the Industrial Advisory Council

Tentative Date in 2010:
Friday, March 12 in the Lory Student Center at CSU
Objectives

• Make this the preeminent I.C.T. futures event in Colorado
• Provide a look into the near future (2010-2015) of Information and Communication Technology
• **Focus on cutting-edge & high-growth areas**
• Speakers for the conference are drawn from industry, the academy, and government
Target Audiences

• #1 - CSU students majoring in information and communication technology fields
  - Especially seniors and graduate students in class of 2010 – this is their future
• CSU faculty and staff
• ISTeC Industrial Advisory Council member companies and their representatives
• CSU alumni
• General public
Third time we’ve held this event

Concept was developed with HP -- primary sponsor in September 2005

Keynote was a success – filled the Lory ballroom for excellent session with Ed Leonard, CTO of Dreamworks studios
FutureVisions in 2007

- **3 Plenary Sessions:**
- “The Merger of Designed and Real Worlds in Google Earth” (thanks to Scott Green)
- “Future of Innovation in IT” (Dr. Jurij Paraszczak, IBM)
- “Life in Virtual Worlds: Unique Applications in Second Life” (Dr. Richard Hackthorn, Bolder Tech.)
- Three concurrent topical tracks in a.m. & p.m.
- This model worked well
FutureVisions 2007 Sponsors

Thank you, again…
Format and Theme

- Three keynote sessions: Opening, Mid-day, and Closing
- Should be visual and thought-provoking
- Also need ideas for NINE break-out sessions in three tracks
- Past tracks have included digital media, computer security, ICT in growth industries (health, biotech and energy)
- December 2009 will mark 40th anniversary of the four-node ARPANET (December 5, 1969)
- Should we tie into this in some way?
The Basic Problem

• Be futuristic enough to get into unusual, unexplored areas…
• That will still resonate with our audience
• Sound familiar? Design a ground-breaking product…
• That will still be familiar enough for acceptance by consumers today
• Heart of Diffusion of Innovations theory
Some Keynote Ideas...

- **Possible Speaker** – Ray Kurzweil  
  (music synthesizer creator, inventor, and author)  
  Will do teleconference for lower fee  
  **Topic** – The Technological Singularity  
  (see his Web site)

- **Possible Speaker** – Marissa Mayer  
  VP, Search Products and User Experience, Google  
  **Topic** – The Future of Search

- **Possible Speaker** -- Dennis Bushnell, Chief Scientist at NASA's Langley Research Center (had date conflict with FV in 2007)  
  **Topic** – “The Bots, Borgs, and Humans Welcome you to 2025 A.D: A ‘Wave-Top’ Tour through Emerging Technologies and their Potential Applications and Implications”
Need Three Breakout Tracks for FV in 2010

- Each in a large ballroom at Lory
- Three sessions in each track -- 9:00-9:50, 10:00-10:50 a.m., and 2:10-3:00 p.m.

1) Cloud Computing?
2) Human-Computer Interaction (interface)?
3) Data and Computer Security? Conficker…
4) Other??? – IT in ET?
5) Social Networking? Facebook has 200 million users -- Linkedin is rapidly growing
Cloud Computing

• Suggested by IAC member Bob Marcus who couldn’t attend today
• Themes?
• Speakers?
HCI

- **Topic of research at CSU by Dr. Chuck Anderson of CS**
- Create keynote session and/or track on **EEG control by humans of robots**
- Perhaps in context of predicted HCI advances in next 10-20 years
- Honda calls theirs **“BMI” – Brain-Machine-Interface** -- human brain controls their Asimo robot
- Link to bionic devices such as prosthetics for wounded veterans
Dean Kamen and the DEKA Arm

• Creator of the Segway and many medical devices

• Created **DEKA arm** with DARPA funds

• Subject of profile on *60 Minutes* on Sunday

• Kamen as possible keynote speaker?

Double amputee Chuck Hildreth wearing the DEKA arm
Another Idea...

- Examine linkage between IT and ET:
  - IT applications in Energy Technology
  - Applications in developing Smart Grids that can sense power needs and generate and route sustainable power to it
  - Smart networks for charging electric cars (example is Shai Agassi’s *Better Place* system)
  - Topics? Speakers?
We Need Your Ideas and Support…

- Identifying overall conference theme
- Assistance in planning the keynote and breakout sessions – can be accomplished online
- Identifying speakers for sessions and tracks
- Volunteers to serve on planning committees
- Talking this event up with your colleagues
- Attending and sponsoring the event
- Would a Wiki be the best forum for posting and discussing ideas?
Interested in assisting with planning FutureVisions?

Contact us at
ISTeC at CSU
hj@colostate.edu
pete.seel@colostate.edu
970-491-2030
Thanks for your ideas about the future of ICT....
ISTeC HPC Affinity Groups

Pat Burns, VP for IT
ISTeC IAC Meeting
April 14, 2009
NSF Model for HPC

- **Track 1** – national-scale system, one award
  - NCSA @ $208M
- **Track 2** – regional-scale systems, four ‘awards’
  1. TACC/UA/Cornell - $59M
  2. UTK/ORNL/NCAR/TACC – $65M
  3. PSC – $45M, in process?
  4. Split into 4 pieces, awards pending….
- **Track 3** – campus-level systems: $1-2M
NSF Computing Model

One

Track 1
Special Purpose

Three

Track 2
‘Big’ Problems

Many

Track 3
Development, scaling

National
Regional
Campus
Track 1: NCSA

- ‘Blue Waters’
- IBM power 7 system in development
- Scheduled for 2011
- ~10 peak PFLOPs
Track 2: #1 Tex. Adv. Comp. Ctr./UA/Cornell

- Track-2 system ‘Ranger’
  - Sun Microsystems
  - 3,936 nodes
  - 62,976 cores
  - 123 TBytes memory
  - InfiniBand interconnect
  - 1.73 PBytes disk (shared)
  - 31.4 TBytes (local)
  - 579.4 peak TFLOPs
Track 2: #2 UTK/ORNL/TACC/NCAR

- Cray XT5 ‘Kraken’
  - 8,256 Dell nodes
  - 66,048 AMD cores
  - 35,328 @ 2 GBytes
  - 30,720 @ 1 GByte
  - 132 TBytes total
  - 608 peak TFLOPs
  - Cray torus interconnect

- High-performance storage subsystem
Track 2: #3 PSC

- Believe an SGI system is under consideration
  - Rackable Systems, Inc. purchase of SGI for $25M?
  - No news on the PSC website
Local Track 3 Systems

• Colorado School of Mines
  – Installed July 2008
  – 268 nodes, 2,144 cores, 5.6 TB RAM, 300 TB disk

• University of Colorado at Boulder
  – Being installed, latest Sun, details TBD

• Colorado State University
  – Proposal in review by NSF, ‘data intensive’ applications
CSU’s HPC Proposal

- HPC system (will RFP)
  - 2,000 cores
  - 4 TB RAM
  - 384 TB disk
  - Back-end GPUs
- 2 vis. Systems
- 10 gig WAN upgrade
  - 2nd GENI wave
CSU’s Emphasis

- **GS 510 – Intro. To HPC**
  - MPI, Open MP
  - Architectures
  - Parallel performance

- **GS 511 – HPC apps.**
  - Prereq: ‘some programming’
  - Algorithms
  - Applications
  - Pair math & CS with scientists
  - IAC advisors and mentors
  - Project
HPC Consortium

• CSM, CSU and UCB (institutions) share:
  – HPC & visualization resources
  – Classes, instructors & students

• Institutions & IAC share above, plus
  – Research, programming, expertise, … via affinity groups
  – Workshops, seminars
Affinity Groups – IAC Participation

- Research areas
- Applications areas
- Algorithms
- Architectures

- Data-intensive apps
- Parallel IO
- Back-end processing
- Hybrid programming
  - MPI, Open MP, GPUs
- Stronger scaling
  - Onward to Track 2, 1
  - ...
Questions

• Are more than welcome…
Continuing Education at Colorado State University

Overview for ISTeC

April 14, 2009
Continuing Education at CSU

- Over 40 years of distance education
- Roots in Engineering and Technology
- From Betamax to iPods
- Serve our customers: industry, students, and campus community
- Locations: Fort Collins, Denver Learning Center, Brighton, Centerra in Loveland, Online
- Enterprise status
  - Continuing Education can operate like a business
Continuing Education Today

- CE is very successful for CSU
  - At the heart of this success are our people and programs
  - Strong customer focus

- CE is becoming market-driven
  - Drawing from industry to develop new programs

- CE has accumulated cash reserves
  - This gives us the ability to help campus at a critical time of need
  - We can invest with our colleges so we generate new distance programs that then repay the investment fund
Here We Grow…

- The market for off-campus and distance education is booming – growing at 4 times campus rates
  - Continuing Education is a leader in Colorado and in the U.S.
  - Continuing Education can innovate for a campus that is short on cash

- CE has direct access to over 135 majors on the Fort Collins campus along with related courses and certificates
  - A major market advantage based on the breadth of programs and ability to do online, hybrid and classroom as needed

- Most public State Universities will go online
  - CE and Global Campus are in the market for CSU
  - There are over 20 online offerings in CO alone
  - CSU-Global information
Focus on Industry Needs

- Online education – Using newer technologies so that employees can learn on the go and apply what is being learned.
  - Asynchronous vs. Synchronous benefits
  - Interactive technology – virtual hand and webcam
  - Schedule courses from 5:15 – 8 p.m. MT
  - Flexible assignments

- Site-based learning centers can host workshops, conferences, and industry needs.
Meeting Industry Needs

- Building long-lasting partnerships
  - Using experts on campus to leverage research for industry needs – Systems Engineering example
  - Enhanced student services for retention and support
  - Helping with growth, retraining, and corporate connections

- Campus connections
  - Support students and industry by using connecting to Career Center, Writing Center, CSURF/research, and other campus or community connections (Larimer Country Workforce)

- Understanding our role at CSU
  - CE is here to leverage and reward campus through our distance education management capabilities
  - CE is willing to give financial gains back to Colleges and partners (ArcGIS example)
Meeting Industry Needs

- Supplier management
  - Assuring a strong relationships with industry and market forecasting
- Market strategy and marketing
- New product development
- Student success
  - Assuring students are supported to reach their goals (enrollment success and completion %)
- Sales and community relations
  - Selling all products in all appropriate geographies
Questions
The Computer Science Department has 19 tenure-track faculty, 3 lecturers, 300 undergraduates, and 175 graduate students pursuing masters and doctoral degrees both on-campus and on-line.

The department offers cutting-edge research programs in:

- Artificial Intelligence
- Software Engineering
- Parallel and Embedded Systems
- Computer Security
The Master of Computer Science at Colorado State University

- This is a coursework only degree.
- Our classes are 4 credits (coursework + a lab).
- The MCS degree is 39 credits (roughly 10 classes).
- We have approximately 50 online MCS students.
- We graduate 10 top 15 MCS students per year.
- Students can use some credits from other programs.
- Students can also take some classes from other CSU programs. Both Statistics and Business offer a range of online classes at the MS level.
CS Online Courses

- CS414 Object-Oriented Design
- CS430 Database Systems
- CS451 Operating Systems
- CS457 Networking and the Internet
- CS470 Computer Architecture
- CS475 Parallel Programming
- CS514 Software Product and Process Evaluation
- CS517 Software Specification and Design
- CS530 Fault-Tolerant Computing
- CS545 Machine Learning
- CS551 Advanced Operating Systems
- CS556 Computer Security
- CS575 Parallel Programming Processing
Artificial Intelligence (AI)

- **Whitley**: Genetic Algorithms, Scheduling
- **Howe**: Planning, Web Agents
- **Draper**: Computer Vision, Machine Learning
- **Beveridge**: Computer Vision, Search
- **Anderson**: Reinforcement Learning, Machine Learning
- **Ben-Hur**: Bioinformatics, Machine Learning
Compilers, Parallel Systems, Algorithms

- **Bohm**: Parallel Algorithms, Compilers
- **Rajopadhye**: Systolic Algorithms, Program Transformations
- **Grit**: Functional Programming
- **Strout**: High-Performance Computing
- **McConnell**: Graph and String Algorithms
Software Engineering

- **Bieman**: Software Design Evaluation
- **France**: OO Analysis and Design, UML
- **Ghosh**: Testing, Distributed Objects
- **Malaiya**: Testing and Reliability, Fault Tolerance
Networks and Security

- **IK Ray**: Design Specification, Databases
- **IJ Ray**: Networks and Security
- **Massey**: Networks
- **Papadopoulos**: Networks and Security