Distance Learning in Satellite Meteorology using VISITview

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by

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Who am I?

- Degrees in Meteorology
  - Minor in computer science
- 40 years experience in software development
- Piano player
- Worked for the U.S. Weather Bureau and the University of Wisconsin-Madison
- Father, and 2 x grandfather
- 3 cats.....
The VISIT Program History (how VISITview was born)

- **Virtual Institute for Satellite Integration Training**
- Began in 1998 to facilitate “teletraining”
  - Residence (classroom) training too expensive!
- Cooperative venture:
  - University of Wisconsin
  - Colorado State University
  - COMET
  - U.S National Weather Service Training Branch and WDTB
    - ....and now EUMETSAT
- Requirements:
  - Needed inexpensive, platform-independent tools to enable remote training
  - Must be able to animate images in a controlled way
  - Must be able to annotate on top of animations
Residence training vs. teletraining

• Residence (classroom)
  − More time
  − Travel
  − Away from work
  − Away from family

• Teletraining
  − None of the above
  − Impersonal?
  − Connect to experts
  − Small groups - feedback
VISITview project goals

- Instructor-driven development & requirements
- Platform independent
- Easy to use
- Open source – no cost!
- Useful for both training and collaborations
- Several “modes” of operation
  - Instructor – full control
  - Student – limited control
  - Listener – no control
- Record and playback sessions
- Continue to evolve as needs change
- More than 25,000 people trained...and counting
Some **VISITview** users

- U.S. National Weather Service
  - Routine teletraining activities

- WMO Virtual Lab Focus Group
  - Americas

- WMO High Profile Training Event
  - Global event

- RMTCs and National Services
  - South Africa, Brazil, Finland, Australia, ....
Many training opportunities for forecasters every month
- Offices sign up to participate
- Forecasters given credit for participation

Statistics through June, 2008
- 1350 sessions
- 17134 participants
**VL Focus Group**

- Monthly briefings and training

- Up to 30 participants each time
  - Many Central and South American countries
  - Discussions in Spanish, coordinated through NOAA and CIRA
  - Yahoo! Voice Conferencing used for audio

- Data server for realtime data always up and running
  - Modest use between formal sessions
Four core interactive online lectures will be presented to WMO Members in each Region through the local WMO Centre of Excellence (Niger, Oman, Kenya, Barbados, Brazil, Costa Rica, China and Australia)

- 100s of participants
- One lecture reportedly had more than 80 connections
Global Perspective
The parts of VISITview

- The VISITview Lesson Builder
  - Used by instructors
  - Collect material to create lesson
  - Create installation file for lesson

- The VISITview Server
  - Uses TCP/IP registered port 1631
  - Keeps track of sessions and groups
  - Sends messages among group members

- The VISITview Client
  - Provides the user interface for a session
  - Runs through a browser -or- as a stand-alone application
Communications model

VISITview
Server
Collaboration or training?

- Both require you to make a “lesson”
- Collaborations may be done from your desktop without an external VISITview server (as long as firewalls permit)
  - Useful for quick, “look at this” connections with others
- Collaborations may also be done from a central server that hosts a VISITview and an HTTP server
  - Useful for real-time data discussions
- Training usually involves longer preparation of a “lesson”
VISITview terminology

• A lesson is a collection of pages and related material
• A page consists of one or more frames
• A frame is an image file (GIF, JPG, PNG)
• A “portal” is a small sub-frame that may contain
  − Geolocated, related images that may be moved around
  − Non geolocated “fixed” images
  − May contain animations
• An “overlay” is a frame that is shown on top of a background frame (mostly transparent!)
• A “group” is a collection of users doing one session
Some client functions

- Change pages
- Change graphic colors, erase some/all
- Animate, step, set speed, fade
- Drawing lines, arrows, boxes, circles
- Put text or phrases on screen

Big Red Pointer

Current TPC/NHC Products Used to Convey Uncertainty

Indicates likelihood of a “close approach” of the center.
Mouse and Keyboard

- Click to move Big Red Pointer
- Drag to draw — (freehand, lines, arrows, boxes, circles)
- Paste text (pre-defined or ad hoc)
- Zoom/unzoom, roam
- Chat window
- Get help
- Change direction of Big Red Pointer
- Open optional windows:
  - Help
  - Phrase list
  - Page list
- Move Control Panel to foreground
The VISITview Lesson Builder

- The VISITview Lesson Builder
  - *Is not* PowerPoint or Corel Draw or OpenOffice!!
  - More of a “slide organizer” than a creator
- Written in Java – run anywhere!
- Import presentations (from exported images of slides)
- Point to remote servers for real-time data
- Attach a local or remote HTML file
- Working with “portals” and “overlays”
- Creating phrases to use during training
Steps in making a Lesson

• Organize your images, animations, portals and overlays
• Add links to text files
• Save the lesson (creates a ZIP file or .exe for Windows)
  - Define essential metadata – including “group”, phrases, etc.
• Test your lesson
• Repeat . . . . . . . . .
The process

- Lesson Builder
- Organize Slides
- Save to Disk
- Test !!! and Make Changes (VISITlocal)
- Package for Distribution
- Give Your Lesson
- Record it
Everything you wanted to know....
Save: change any values, then click OK
Distributing a Lesson

• Lessons may be used through a web browser or downloaded to the student's machine
  - Web browser mode
    • Mode is not appropriate if long animations are used (> 4 frames)
    • Requires you to post the lesson on the same machine that has the VISITview Server running!
  - Downloaded (application) mode
    • may use servers anywhere
    • Usual distribution of the lessons via “ftp” is common
• Make sure everyone has the same version!
• “Beta-test” a few times
Running a “live” training session

• Audio – use telephone or Skype or Yahoo! Voice Messenger
• VISITview requires a server somewhere
  − “open” server at SSEC (visit.ssec.wisc.edu)
• Usually one “Master” and several “Students”
  − During collaborations, however, everyone is a “Master”
  − Can also use “Listener” mode
• Use the “Status” window to keep track of who is connected and how they're doing
• Encourage the use of “Chat” capability for questions
Screen shot of session

Current TPC/NHC Products Used to Convey Uncertainty

Strike Probability Graphic
Indicates likelihood of a “close approach” of the center.
Quick Help (ALT+?)

VISITview - Help Information

VISITview Mouse Actions & Keyboard Commands

To move Big Red Pointer -- click left button

To draw freehand -- drag pointer (hold button while moving
  (Use right button to append an arrow head)
To draw straight line -- hold CTRL down and drag mouse pointer
  (Use right button to append an arrow head)
To draw box -- hold CTRL & SHIFT down and drag mouse pointer
  (Use right button to draw a circle)

For all drawing:
  ESC = cancel, Release button = send

ALT+Z -- zoom
ALT+R -- un-zoom / restore
ALT+C -- open chat window
ALT+T -- make text on screen
  (ESC = cancel, Right-click or Enter = send)
  (Change font size using [xx] at start of text string)
ALT+o -- open phrase window (if phrases were defined)
ALT+L -- optional page list
ALT+S -- status window
ALT+K -- toggle portal cursor
ALT+E -- erase last graphic drawn
ALT+M -- show hidden control frame (or click right button)

ALT+(1-8) -- set angle of Big Red Pointer
ALT+0 [zero] -- toggle BRP persistence

Dismiss
Control Panel (multi-lingual)

English

French

Spanish
The Instructor Experience

• *Is anybody out there listening??*

• Just what *does* constitute “Good Teletraining”?
  - Do NOT just read the words on the pages!!
  - Use lots of annotations
    - Move the Big Red Pointer
    - Draw lines, boxes, circles
    - Paste “phrases” on the screen
  - Create many pictures – not just words!
  - Use animations, overlays, portals – visual stimulation
  - Ask questions – use the “quiz feature”
  - Keep the “status window” open

• Ask for suggestions, comments, criticisms

• Improve the lesson each time you give it!
The Student Experience

- More coffee, please I am falling to sleep....yawn!
  - Keep it moving, no long pauses, be entertaining!
- What is he talking about?
  - Make sure the students are with you – ask questions!
- Will there be a quiz?
  - A single “quiz question” every few pages is good
- Do I really need to know this stuff?
  - Make sure the material is relevant
What can go wrong?

Wrong lesson file

Firewalls

Instructor stuck at home

Telephone not working

Internet connection drop-out

One site running really slowly.....

Router failure
On-line lessons available

- CRAS Forecast Imagery in AWIPS
- MODIS Products in AWIPS
- Introduction to Gridded MOS
- The GOES 3.9 mm Channel
- Pulse Thunderstorms, Overview and Warning Strategies
- GOES High Density Winds
- CPC Monitoring Products
- CPC Long Range Forecasting
- CPC Extended Range Forecasting
- Monitoring Gulf Moisture Return with GOES Imagery
- Local Climate Products: Downscaling Basics
- AvnFPS 3.0
- Predicting Supercell Motion in Operations
- Utilizing GOES Imagery within AWIPS to Forecast Winter Storms
- DGEX: Its uses and limitations
- Modern Severe Weather Parameters
- Forecasting Convective Downburst Potential Using GOES Sounder Derived Products
- QuikSCAT winds
- Interactive Cloud Height Algorithm and GOES Sounder Point Retrievals in AWIPS
- Applying the Ten Principles of Climate Monitoring in NWS Field Operations
- Mesoscale Convective Vortices
- NOAA Seasonal Atlantic Hurricane Outlooks
- Water Vapor Channel Satellite Imagery
- Use of GOES/RSO imagery with other Remote Sensor Data for Diagnosing Severe Weather across the CONUS (RSO 3)
- Navigating the Climate Prediction Center's Website
- Introducing GOES-12
- Wildland Fire Detection using Satellite Imagery
- The Satellite Rainfall Hydro-Estimator
- TROWAL Identification
- Lake-Effect Snow I
- Anticipating Mesoscale Band Formation in Winter Storms
- Subtropical Cyclone Analysis with Satellite Data
- POES Tropical Rainfall Potential
- Cyclogenesis: Analysis utilizing Geostationary Satellite Imagery
- Tornado Warning Guidance 2002
- Meteorological uses of ACARS Data
- Fog Detection and Analysis with Satellite Data
- What can you expect from the Eta-12?
- Ensemble Prediction Systems
- Lightning Meteorology II
- Introduction to POES Data and Products
- Forecasting Mesoscale Convective Systems
- Mesoscale Analysis of Convective Weather Using GOES RSO Imagery
- GOES High-Density Winds
- GOES Sounder Data and Products
- Top Ten Misconceptions about NWP Models
- Using Near-Storm Environment Data in the Warning Decision Making Process
- An Application of Pattern Recognition to Medium Range Forecasting
- HPC Medium Range Forecasting
- Precipitation Type Forecasting
- Lightning Meteorology I
- An Ingredients-Based Approach to Forecasting Winter Season Precipitation
- Using AWIPS to Evaluate Model Initializations
- Lake-Effect Snow I
- QuikSCAT
- Diagnosing the Potential for Surface Boundaries to Initiate Convection
- Applying Mesoscale Tools and Techniques to Predict and Detect Severe Thunderstorm Development
- Diagnosing Elevated Mesoscale Ascent -The Midland TX Heavy Snow Event
- Natural Disaster Information Cards
- Detecting Boundaries
- Using GOES Rapid Scan Operations (RSO) in AWIPS
- The Enhanced-V: A Satellite Severe Storm Signature
- CONUS CG Lightning Activity
- Tropical Satellite Imagery and Products
- Detecting Low-level Thunderstorm Outflow Boundaries At Night Using GOES
More resources

VISITview Home page:

http://www.ssec.wisc.edu/visitview

Tutorial:

http://www.ssec.wisc.edu/visitview/tutorial
Spin-Off: AnimationS applet (AniS)

- AniS reused many of the classes from VISITview
- A simple applet for animating images, making overlays, etc.
- Used all over the world
  - Radar
  - Satellite
  - Model output
  - Slide shows
  - Simulated 3D views of geography
- Translated into 5 languages (and counting)
- Open source and free for use by anyone
- Homepage: www.ssec.wisc.edu/anis
- Coming soon: a Flash version!