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**Naval Postgraduate School
Monterey, California**

Mobile Devices & Distributed Learning

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- Already exceed the desktop and laptops!
- Networking – 2G, 2.5/3G, WLAN and Bluetooth built in to every single smartphone of today
- Content capture – Pre-equipped with photo ([12 Mpixels this year!](#)) and Video ([HDTV capture](#) coming!) camera, audio
- Sensors – GPS, Accelerometer already built in, more sensors coming



- Learning on the go
- Learning on demand
- Collaborative Learning
 - Learning from One Another



- Preparing for a new mission – military, first responders etc
 - Time is precious
 - Information changes in real-time – out of date material can be dangerous, especially in irregular warfare
- Every soldier can become a collector of data
 - Collect pics / vids using handhelds
 - Auto meta-data tagging with manual options
 - Disseminate to all who need info in real-time



- Unit turn over – when a current unit is turning over a territory to a new unit
- Knowledge transfer is critical
- As the situation changes, the information needs to be updated frequently and in real-time
- Nothing suits the needs better than mobile devices





- We have become used to on demand everything!
- We don't want to wait and like to get things when we want or need them
 - Learning process takes place in context and on demand (as opposed to “organized page turning”)
- Enables workers to access training when they need it, reducing classroom training expense, and producing an immediate impact on performance.



Space & Time Dimensions for Learning

- Same space & same time – Synchronous (e.g., classroom, face to face meetings)
- Different space & different time – Asynchronous (e.g. stored and remotely accessible)
- Same time & different space – Synchronous in time (e.g., live broadcast)
- Same space & different time – (e.g. shift work)
- It is possible to develop a single system that caters to all three!



- Enable students to
 - Receive power point slides complete with the sound track
 - Annotate slides with their notes
 - Share notes with group members in real-time and on their handhelds.



Collaborative Note Taking





- Same time and same location
 - In the classroom
- Same time and different location
 - Students who are offsite can receive slides and notes in real-time
- Different time and different location
 - Receive slides and notes after class anywhere
- Same space and different time
 - Subsequent class benefits from the slides and notes



- Students accessed slides and notes just before exam – standard behavior 😊
- Completed in 2005
- Productized by Fuji-Xerox



- Content creation has become easy
 - Phones are a good way to capture pictures, videos and sounds
- Sharing is tedious
 - Push by email or MMS (Multimedia Messaging)
 - Time consuming
 - Wasteful of resources
 - Upload to portals (flickr, youtube etc)
 - Extra steps
 - Privacy issues
 - Inform intended recipients
- For first-responders (or other busy people), this won't work.



What is TwiddleNet?

- Turns smartphones into personal mobile servers
- Personal servers host user's content – images, videos, audio, other real-time sensor data
- TwiddleNet gateway ties the personal mobile servers into a network



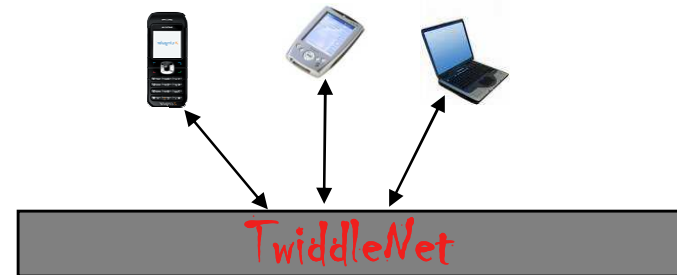
Why TwiddleNet?

- Immediate content capture and publish
- Full owner control of content
- Harness the power of mobile devices twiddling most of the time
- Allow access to content which is otherwise inaccessible



TwiddleNet Architecture

- Gateway to personal mobile servers
- Allows search, viewing and download of content hosted on personal servers
- Content access statistics for smart caching
- Accessible from handhelds and desktops
- Match the end-user device capability





- Phones can work as personal content servers or content requesters.
 - In the server mode, they capture content, tag it and send alerts to the portal.
 - In the content requester mode, they get updates from portal and request desired content from servers.
- Devices can perform both roles simultaneously.



- Mobile devices have come a long way
 - Exploit the content capture, connectivity and sensing capabilities
- Best match for delivering Advanced Distributed Learning
 - Low cost
 - Convenient
 - Effective



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Thank you

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**Live without a Laptop
and
Be able to do more!!**



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Samsung Pixon 12





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Nvidia Tegra HD Mobile Phone

<http://www.youtube.com/watch?v=rQa9nP4yym>

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