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DisplayWall

VIRTUAL MICROSCOPY

LEARNING CONTEXT

In the Human Health and Disease course as well as Histology, students use microscopes in small groups in the Fleischmann Labs to see details in cells and pathology slides. Both courses are beginning to use virtual microscopy (google maps-style imaging) as references for students or in required course sessions. Students can view these images on their own at home or on lab computers.
Once or twice a week after relevant lectures students will go up to the 8 Fleischmann Labs sections and meet with a pathologist, specialist, and/or TAs to look at slides and discuss course content. Virtual slides are not currently a part of this session but faculty often use the AV out to project slides onto plasma screens or a projector, or they use multi-headed microscopes.

LEARNING PROBLEM

When viewing images on a microscope or projection screen, students often must zoom in extremely far to see the small structures and then don't learn the context of what they're looking at.

SOLUTION

Students will benefit from seeing tiny structures in the context of a larger portion of the slide than is normally visible in a microscope and projection screen. The Display-Wall will allow faculty, TAs, and students to reference best-example slides with a very large viewing area. These slides will be accessible to students at home and in the computer labs, as well, via Aperio or Zoomify viewers.

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PATHOLOGY
"MAN IN THE PAN"

LEARNING CONTEXT

Pathologists give regular "Man in the Pan" small group lectures/discussions with students. One pathologist meets with a group of 6 students in the Fleischmann Labs, gives a small lecture, and then they move to the Pathology wing. A specimen is set up in a pan with a professional digital camera, computer, and touch-screen LCD are set up like a document camera. The dissected organ must stay in the wing due to HIPAA requirements. Students crowd around the specimen and look at the screen to see high-resolution macro captures of the specimen. Sometimes the pathologist spends time beforehand manually stitching together multiple images to get higher resolution results.

LEARNING PROBLEM

The benefit of having a small group for sessions like this is that students can get up close and see the specimens in high-detail. Unfortunately, with a single standard resolution screen, the current setup does not allow for large high-resolution viewing. Also, while a skilled pathologist can sometimes spend time in advance to tile together multiple images in Photoshop, it is currently impossible to obtain an extremely high-resolution still from a specimen immediately in front of the group.

SOLUTION

A DisplayWall would allow a compacted Pathology room to show extremely high-resolution images of very fresh specimens to groups of students. Less image preparation time would be required so pathologists could choose the most recent and best-example specimens for students.

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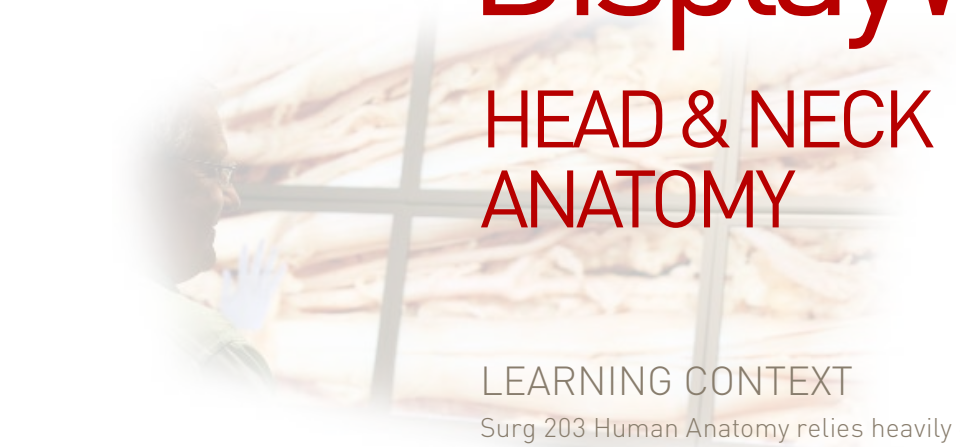
HEAD & NECK ANATOMY



LEARNING CONTEXT

Surg 203 Human Anatomy relies heavily on students' dissection of cadavers to help them learn about the human body. 86 students attend lecture every Tuesday from 1:15pm–2:15pm and then move to the dissection rooms until 5:00pm where four students work on a cadaver at a time. TAs and faculty move between groups to help guide groups and answer questions. At the beginning of dissection, faculty occasionally use video cameras and a projector to do a "prosection" of the cadaver and show students on a large screen an example of what they will see when they dissect for the day (although they're moving away from prosections). Occasionally students may meet impromptu with a faculty out in the hallway to view x-ray images or

LEARNING PROBLEM

In head and neck anatomy, even with enlarged images on a projection screen, students may not make out the small nerves and blood vessels they are supposed to be dissecting in the lab. They make mistakes while dissecting that damage their specimens and no longer see a good example of what they're looking for.

SOLUTION

A DisplayWall in a corner of the dissection labs or at a common entry point would provide an extremely high-resolution quick reference of a prosection of key areas for the day. There might be one image each day that is an excellent example of what they're looking at that day. Alternatively, faculty or TAs would take photos with a wifi camera throughout the session and images would appear on the DisplayWall instantly so faculty can direct all attention to the DisplayWall and encourage students to look at key "learning moments" or great examples of dissection.

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HUMAN ANATOMY
INNER EAR

LEARNING CONTEXT

Students in Human Anatomy watch lectures about the human body and then work in groups to dissect their own cadavers immediately afterwards. Many dissections require lots of time to prepare and thus students may spend lots of time doing tedious work that does not involve learning.

LEARNING PROBLEM

Dr. Whitmore: "One deficiency in Human Anatomy is that we don't teach the inner ear. There is value in teaching students about the ossicles, but it's so tiny and it's so bloody difficult to dissect that we've never done it before. Our photographs in the atlas are in some ways limited because of the need to show orientation but also details. The pages are just not big enough."

SOLUTION

Faculty will do a detailed prosection of the middle ear and document the steps with a high-resolution still camera. They will create a detailed slideshow of images and show it to students using the DisplayWall.

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NEUROBIOLOGY: CNS VISUAL PERSPECTIVES

LEARNING CONTEXT

86 medical students and a few dozen more graduate and undergraduate students learn neuroanatomy in the NBIO 206 course. Students watch a large-group lecture and then move upstairs to the Fleischmann Labs where they gather in groups of 12-20 students per half-room. TAs lead a short introductory presentation and then students rotate through 4 gross, computer, or atlas stations to learn the topics of the day.

LEARNING PROBLEM

Students have trouble visualizing the small details and how they connect up with each other — vasculature and neuron pathways. They learn the key angles from atlases, but have trouble with 3d rotations. Students do have access to a 3d computer atlas developed at Stanford, CNS: Visual Perspectives, but the computer screens require zooming in and out a lot to examine details.

SOLUTION

A DisplayWall would allow students to cluster around key 3d models like the vasculature, rotate them in real-time, and examine details closely while still seeing them in the context of the head.

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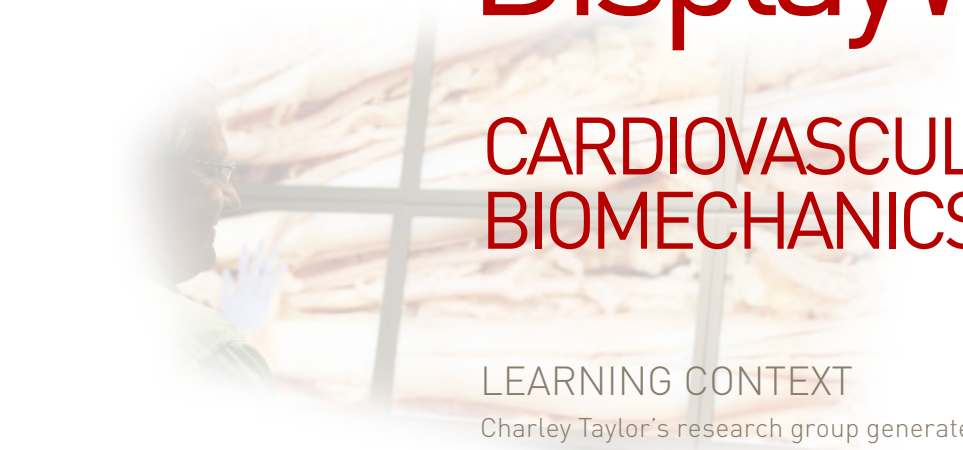

CARDIOVASCULAR BIOMECHANICS

LEARNING CONTEXT

Charley Taylor's research group generates visualizations of cardiovascular simulations. The simulations run on large multiprocessor servers and produce large amounts of data which can best be understood through visualization.

LEARNING PROBLEM

The renderings of the flow simulations can be done at high resolutions. The details are difficult to see on typical 640×480 presentation movies.

SOLUTION

A DisplayWall can be used to disseminate the information during presentations or demos.

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HISTOLOGY LAB SESSIONS

LEARNING CONTEXT

Dr. Pat Cross runs a number of Histology lab sessions in the Cells to Tissues and Human Health and Disease courses. One of the important components of her lab sessions is identifying normal parts of slides and cells.

LEARNING PROBLEM

Dr. Cross likes students to explore the virtual slides and pick out unknowns, then discuss them with students. Previously they tried sessions where students used laptops and individually explored slides but they had trouble sharing their unknowns quickly with each other.

SOLUTION

A DisplayWall and high-resolution scan of a slide would help students explore the same slide together and quickly point out details to show other students.

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LANE LIBRARY ARCHIVE PRESENTATIONS

LEARNING CONTEXT

The Lane Medical Library archives contain a number of precious old artifacts and books. Researchers and the public may be interested in reviewing these materials, but they currently must schedule time with archivist Drew Bourn and handle objects carefully only in the archives area of Lane.

LEARNING PROBLEM

Some materials such as the 16th century Vesalius, a seminal work that changed medical education, are too precious to share with the public but would be of high-interest.

SOLUTION

A DisplayWall and high-resolution captures and scans of materials could be put in a Lane or publicly-accessible location so visitors and researchers could access virtual high-resolution archives of materials.

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DERMATOLOGY

LEARNING CONTEXT

Visual examination and comparisons are an important component of dermatology clerkship education and practice. Cosmetic surgery "Before/After" results and comparison of malignant/benign pigmented lesions are some examples where images are regularly captured and reviewed with learners and patients.

LEARNING PROBLEM

In scenarios such as Telemedicine and teaching sessions, it's difficult to see subtle details of scarring, color, and details in lesions. Also, patients may also want to learn more about their conditions but can't look through a magnifying glass at their own skin.

SOLUTION

Dermatologists would use the DisplayWall and a high-resolution camera to capture images of patient cases and review them in detail with students, with high-resolution details allowing for exploration. Patients would also be able to review their results immediately in a way where they could see the full detail of what the dermatiologist sees.

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YOUR SCENARIO

LEARNING CONTEXT

LEARNING PROBLEM

SOLUTION

NAME _____ EMAIL _____

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