



Virtual microscope interface to high resolution histological images

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Abstract

Introduction: The Hypertext atlas of Dermatopathology, the Atlas of Fetal and Neonatal Pathology and Hypertext atlas of Pathology (this one in Czech only) are available at www.muni.cz/atlasses. These atlases offer many clinical, macroscopic and microscopic images, together with short introductory texts. Most of the images are annotated and arrows pointing to the important parts of the image can be activated.

Material and Methods: Leica DMLA microscope with motorized stage is used to obtain image parts, which are stitched together to one high resolution image. Individual image parts can be taken in more focusing planes and pan-focus algorithm can be used to create an image with increased image depth. Alternatively image stacks can be saved and high resolution images in several focusing planes can be created. Both these methods are useful to overcome image artefacts caused by uneven slides.

Results: The Virtual Microscope interface is used for the access to such histological images. The virtual microscope is programmed in JavaScript only, works in Firefox/Mozilla and MSIE browsers without need to install any additional software.

The browser loads proper parts of image according to the viewport, magnification and focusing level. It reacts to user's actions through catching events, calculates the names of corresponding new image tiles, which are loaded and added into the DOM of the image being displayed. The image parts, which got out of the viewport, are released from memory. The virtual microscope interface works reasonably smooth.

Discussion: Our atlases are continuously upgraded and expanded. In addition to above mentioned Atlas of Dermatopathology and Atlas of Fetopathology and Neonatal Pathology we are preparing new atlases (of muscle pathology and bone marrow biopsy). In future image sharing of our images will be possible as well, so that other teachers will be able to include links to images in our atlases, comment them according to their taste and still have access to all the features of the virtual microscope.

Keywords: fetal pathology, atlas, multimedia, Internet.

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