RESPONSIVE GRAPHICAL USER INTERFACE FOR STAND-ALONE APPLICATIONS

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In this talk we introduce the responsive graphical user interface (ReGUI) approach to creating applications, and demonstrate how this approach can be implemented using MATLAB. Our choice of MATLAB is also based on the high readability and easy portability of the MATLAB code. The same general technique can be used in other programming languages.

Recall that the responsive web design, introduced by E. Marcotte, is based on the idea that a web page must respond by itself to the users behavior and the constraints of the media environment imposed by its screen size, pixel density, platform and orientation [1]. Hereby we extend this approach to designing the graphical user interface (GUI) of stand-alone applications, and arrive at what we call the *responsive graphical user interface*, abbreviated as *ReGUI*.

We define the requirements to the ReGUI in applications as follows: (R1) independence of the physical dimensions and resolution of the users device screen; (R2) ability to zoom in and out, preserving all proportions in the ReGUI elements, including fonts; (R3) responsiveness of the layout of the logical blocks and the elements of the ReGUI based on the users needs that are indirectly indicated by his/her behavior (resizing the application window, moving it, etc.).

A sample application TeachLCGE [2] has been developed for supporting teaching maxima and minima of functions of two variables. The source code is available at MATLAB Central File Exchange [2], the video demonstration of its ReGUI functionality is available on YouTube [3], and the details are provided in [4].

References

[1] Marcotte, E. Responsive Web Design. *A List Apart*, May 25, 2010. Available at `https://alistapart.com/article/responsive-web-design`. Accessed April 5, 2017.

[2] Mikulszky, M. *TeachLCGE*. Matlab Central File Exchange, submission ID 62480. 2017. Available at `https://www.mathworks.com/matlabcentral/fileexchange/62480`. Accessed September 27, 2017.

[3] Mikulszky, M. *TeachLCGE – MATLAB Application & Responsive GUI Demonstration*. Available at `https://www.youtube.com/watch?v=ndYC11vIT2Y`. Accessed September 27, 2017.

[4] Mikulszky, M., Pocsova, J., Mojzisova A., Podlubny, I. Responsive Graphical User Interface (ReGUI) and Its Implementation in MATLAB, arXiv:1704.03521. Available at `https://arxiv.org/abs/1704.03521`.