**CMSE492 Lab 1. Wang’s method**

04.03.2019

**Task:**

1. Implement Wang’s algorithm [1] in any programming language/operating system available in CMPE-134
2. Test your implementation using Seminar 04.03.2018 examples: “Embed the following secret data, S=’abcde’ (character string in ASCII code), into the cover image, CI=(1,121,159, 162, 199, 253) by Wang’s method using T=160, ml=8, mu=16 Extract the data embedded. Check that the data extracted match the data embedded”.
3. Test your implementation on 4 host 512x512 images (Mandrill, Peppers, Jet, and Lena) used in [1], Secret data stream generate using pseudo-random number generator.
4. For each of 4 variants of embedding secret into the covers, calculate PSNR and compare your results versus [1, Table 1, p. 112].
5. **Defend the Lab on March 20, Wednesday, 16.30-18.20, CMPE-134 (hand in your report to Evaluator, run your program, and explain your work done).**
6. Report shall have
	1. Cover page (University, Department, Course, Semester, Year, City, Country, Lab subject, Team members, Lecturer, Lab assistant)
	2. Outline
	3. Problem definition (see items 1-4 above)
	4. Wang’s method description
	5. Description of Wang’s method implementation in your programming language/operating system
		1. Description of the host images you use and their sources
		2. Description of secret data generation using a pseudo-random number generator
		3. Description of preprocessing phase 1 implementation
		4. Description of embedding phase 2 implementation (**ml, mu, and T must be parameters, not literals**)
		5. Description of extraction phase 3 implementation
		6. Description of PSNR and embedding capacity calculation
	6. Description of the tests conducted and their results, **screenshots** of them
	7. Comparison of your results versus [1, Table 1, p. 112].
	8. Conclusion
	9. References
	10. Appendices with the code developed
	11. CD with all Lab related materials (report, images used, test results, sources, executables). CD shall be runnable (it is possible to install your program from the CD, run it on your examples, and view results you got).

**References**

1. S.-J. Wang, Steganography of capacity required using modulo operator for embedding secret image, Applied Mathematics and Computation, 164 (2005), 99-116, doi:10.1016/j.amc.2004.04.059, <http://cmpe.emu.edu.tr/en/CourseLoad.aspx?id=CMSE492&page=lecturenotes>

**Grading policy: report – 50%, explanations – 50%**