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## When materials engineers meet computer programmers: a new experience for practical engineering training

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### **Abstract:**

As technologies continue to advance, our society needs more and more well-trained materials engineers to develop better solutions for complex materials related problems. Instead of traditional trainings in operating heavy machinery, more hands-on skills in programming tools targeted at materials science and engineering are essential for our students. In this proposal, we aim to integrate technical programming as a learning tool into the existing mandatory summer course (MSE2243: Workshop Practice) to enable our non-programmer students to master MATLAB® in order to solve practical problems in materials science and engineering. The concept of MATLAB® for materials science and engineering here is very unique as it provides an up-to-date learning approach for technical implementation and analysis in the workshop environment. It is also different from conventional programming courses since it builds on the modest mathematical background, introduces technical concepts and programming as an interface tool to tackle materials science problems during the workshop practice. By completing this project, the students would obtain the thorough working familiarity with MATLAB® and more importantly the discovery-oriented experience in materials science and engineering. All these exercises are exclusive and valuable to enhance their problem solving skillsets in tackling the complex material engineering challenges in the development of new products in mechanics, electronics chemistry, life sciences and in modern industry as a whole.