Chapter 11
Conclusion

Now more than ever machine learning and embedded AI will be essential in maintaining information assurance for all aspects of our nation's security and defense, as well as every transaction we make in government and commercial or private business operations. Information is the lifeblood of every business transaction and managing risks related to the use, processing, storage, analysis, and transmission of this information, as well as the enormous "big data" analytics systems upon which we now rely are the vital parts allowing us to process and sustain the flow of information for our modern world. As we increase the numbers of devices and interconnected networks, especially as the Internet of things begins to blossom, enormous risks will continue to emerge. Any disruption to our systems and processes could cause economic collapse for a business, as well as our nation.

This book represents a major contribution in terms of mathematical aspects of machine learning by the authors and collaborators. What we have tried to portray in this book is the current state of the art for machine learning and associated artificial intelligence techniques. The algorithms presented here have been designed to find the local minima in convex optimization schemes and to obtain frictionless global minima from Newton's second law. We believe we have provided a solid theoretical framework upon which further analysis and research can be conducted. We hope this book has been beneficial to you in helping to identify and address existing issues in the fields of machine learning, artificial intelligence, deep neural networks, as well as a plethora of emerging fields. By highlighting a few popular techniques, and demonstrating our new CoCoSSC methodology, to resolve the noisy subspace clustering challenge, we have provided what we consider to be a significant improvement and more robust solution than current methodologies provide. Our numerical results confirm the effectiveness and efficiency of this new method, which we hope will provide a springboard to enhanced operations in the many fields in which it expected to be used. More importantly we hope this new methodology provides a deeper understanding for researchers, as they take this work to the next level.

B. Shi, S. S. Iyengar, *Mathematical Theories of Machine Learning - Theory and Applications*, https://doi.org/10.1007/978-3-030-17076-9_11