We have arrived in Canada for 2 weeks, during which we tried our best to adapt to our life and study.

In these two weeks, I have done some work listed below.

1. Reconstructing the architecture of PMO code which includes
   1. Substituting the function constructing HDMR component functions for the first and second order terms with two separate functions, one for the first order term while another for the second order term. This adjustment makes it easier for function call.
   2. Substituting the function predicting HDMR value including the first and second order terms with two separate functions, one for the first order term while another for the second order term. This adjustment makes it easier for function call and decrease number of parameter passing.
2. Getting a rational solution of a 3-d function in the PMO paper (shown in Chart 1).
3. solution of a 3-d function in the PMO paper

|  |  |  |
| --- | --- | --- |
| Iterations |  |  |
|  |  |  |
| 1 | [0.8213 0.8440 0.0835] | -2.0914 |
| 2 | [0.8213 0.8440 0.0976] | -2.0917 |
| 3 | [0.5840 0.8440 0.0927] | -3.8427 |
| 4 | [0.5730 0.8517 0.0969] | -3.8650 |

1. Reading a thesis “Alternative Kriging-HDMR optimization method with expected improvement sampling strategy” and part of a book called “Engineering Design via surrogate Modelling” to learn Kriging method.
2. Designing the architecture of Kriging code which includes
   1. Function for parameter training.
   2. Function for prediction using trained parameters.
3. Coding the Kriging algorithm
4. Substituting RBF with Kriging in HDMR
5. Using MSE (mean square error) to lead to find next sample points when updating the Kriging function
6. Finishing the sensitivity analysis in Kriging-PMO
7. Creating a new way in updating the cut center. When the current optimum of the HDMR function calculated by GA is higher than the old one, the old optimum point would be inherited, i.e. the current optimal point will be abandoned.

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