DEMO slides

Lv Wenlong

October 31, 2016

Outline

- Pandoc template for my weekly report in my research group meeting
- What's in this demo:
  - CJK font: 中文字体
  - Footnote
  - Figures, like Fig. 1
  - Tables, like Table. 1
  - Equations, like Eq. 1
  - Algorithms
  - IEEE style bibliography[1, 2, 3, 4, 5, 6]
  - Code
  - Multiple columns

Use this template

- Edit meta.yaml for title, author, date
- Edit custom.latex to add custom latex packages
- Edit makefile for markdown file name, target pdf file name, font...
- Edit beamer.tex to modify the beamer template
- Dependency:
  - pandoc
  - pandoc-crossref
  - biber
  - xelatex

中文字体, footnote

马上相逢揖马鞭，客中相见客中怜。欲邀击筑悲歌饮，正值倾家无酒钱[1]。

[1] 李白诗一首。

Figure

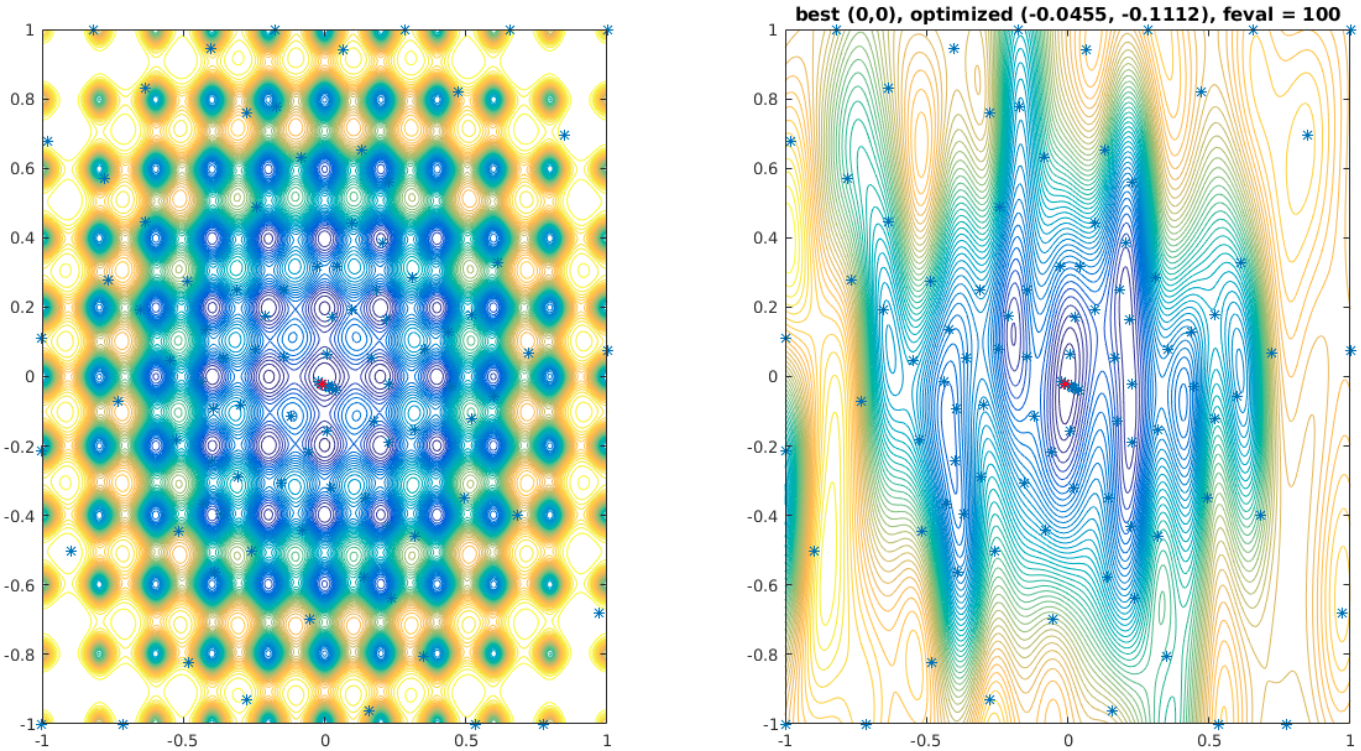

Figure 1: Ackley function and the model after optimization

Table

Table 1: A Table

Language	Good or Bad
Haskell	Good
C++	Good
PHP	Bad

Equation

$$\begin{cases} \mu(\boldsymbol{x}) & = & \mu_0(\boldsymbol{x}) + \boldsymbol{k}(\boldsymbol{x})^T(\boldsymbol{K} + \sigma^2\boldsymbol{I})^{-1}(\boldsymbol{y} - \boldsymbol{m}) \\ \sigma^2(\boldsymbol{x}) & = & k(\boldsymbol{x}, \boldsymbol{x}) - \boldsymbol{k}(\boldsymbol{x})^T(\boldsymbol{K} + \sigma^2\boldsymbol{I})^{-1}\boldsymbol{k}(\boldsymbol{x}) \\ LCB(\boldsymbol{x}) & = & \mu(\boldsymbol{x}) - \kappa\sigma(\boldsymbol{x}) \end{cases} \quad (1)$$

Algorithm

Algorithm 1 Bayesian Optimization

1: Initial Sampling
2: Construct GP model
3: **for** t = 1, 2, ... **do**
4: Find $\boldsymbol{x}_t$ that minimizes LCB
5: Sample $y_t = f(\boldsymbol{x}_t) + \epsilon_t$
6: Update GP model
7: **end for**
8: **return** best $f(\boldsymbol{x})$ recorded during iterations

Code

```
#include <iostream>
using namespace std;
int main()
{
    cout << "Whatever!" << endl;
    return EXIT_SUCCESS;
}
```

Multiple Columns

```cpp
// C++
int fib(int n)
{
    if(n <= 1)
        return 1
    else
    {
        return fib(n-1)
               + fib(n-2);
    }
}
```

```haskell
-- Haskell
fib 0 = 1
fib 1 = 1
fib n = fib (n-1) + fib (n-2)
```

References I

[1] I. Couckuyt, T. Dhaene, and P. Demeester, "ooDACE toolbox: A flexible object-oriented kriging implementation.," *Journal of Machine Learning Research*, vol. 15, no. 1, pp. 3183–3186, 2014.

[2] C. E. Rasmussen, "Gaussian processes for machine learning," , 2006.

[3] B. Shahriari, K. Swersky, Z. Wang, R. P. Adams, and N. de Freitas, "Taking the human out of the loop: A review of bayesian optimization," *Proceedings of the IEEE*, vol. 104, no. 1, pp. 148–175, 2016.

[4] M. A. Gelbart, "Constrained bayesian optimization and applications," PhD thesis, 2015.

[5] B. Liu, D. Zhao, P. Reynaert, and G. G. Gielen, "Gaspad: A general and efficient mm-wave integrated circuit synthesis method based on surrogate model assisted evolutionary algorithm," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 33, no. 2, pp. 169–182, 2014.

References II

[6] A. Melkumyan and F. Ramos, "Multi-kernel gaussian processes," in *IJCAI Proceedings-International Joint Conference on Artificial Intelligence*, vol. 22, 2011, p. 1408.