

Quant Calibration Machine

Please list the principal tasks/responsibilities for this position.

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| 1. | Theoretical work (based on academic research). |
| 2. | Implementation & testing. |
| 3. | Reporting on numerical results / Operational conclusions. |
| 4. | |

Keywords: PnL optimization, Machine learning, Market simulation, Calibration

Environment Applied Research Group, Volatility, Cross Gamma

External Job Description :

When it comes to pricing extra exotic products, choosing the right set of vanillas to calibrate is often a very hard task. Indeed, the number of eligible candidates far exceeds the degrees of liberty of the most flexible pricing models. Furthermore, the more complex the calibration, the harder it is to analyse the product's risks. The goal of this internship is to develop a generic approach to model calibration based on straight-forward criterias such as expected PnL and PnL variance. For that, we will write generic PnL equations valid for all asset classes, take a few pages from data scientists' books, and use a number of optimization tricks.

Academic Papers:

1. Deep Hedging: Hedging Derivatives Under Generic Market Frictions Using Reinforcement Learning, H. Buehler et al., 2018.
2. Stochastic Gradient Methods for Machine Learning, F. Bach, 2013.

Duration : 6 months

Starting Date : Any

Place : Paris, La Defense

Education : Engineering school. Specific degree in Applied Mathematics and Computing greatly appreciated.

Required Skills :

- Analytical and interpersonal communication skills
- Stochastic calculus, probability theory
- C#, Python
- Interest in financial modeling, financial products

Reward : Societe Generale Criteria

Contact : ahmed.tadlaoui-habibi@sgcib.com
yassine.oketokoun@sgcib.com