

Rough Path Theory (STK4290)

1. Definition of a Brownian motion, path properties (i.e. Hölder continuity).
2. Definition of a fractional Brownian motion, path properties (i.e. Hölder continuity with $\alpha < H$ Hurst parameter). See Sect. 1 in the lecture notes (LN).
3. Definition of the Young integral. See (4) in the LN.
4. Theorem 2.2 (Lifting theorem) in the LN: only roughly the statement of the result.
5. Example 2.4 in the LN
6. Chen's relation (2.18).
7. Roughly the motivation of Chen's relation. See (2.17).
8. Rem. 2.5 (iii) as an example for Chen's relation.
9. Def. 2.6 (Rough path space)
10. Def. 2.9 (Geometric rough paths)
11. Definition of $T^{(N)}(\mathbb{R}^d)$, where rough paths live in. See (2.21). Def. of the Lie group $T_1^{(N)}(\mathbb{R}^d)$. See (2.23).
12. Lemma 3.3 (Sewing Lemma): statement of the Lemma.
13. Theorem 3.4 (T. Lyons): statement and idea of the proof
14. Def. 3.5 (Space of controlled rough paths).
15. Theorem 3.8 (M. Gubinelli): statement.
16. Prop. 3.15 (Rough path and Itô integration): statement of the result.
17. Def. of the Itô integral (Def. 3.12).
18. Theorem 4.3 (Existence and uniqueness of RDE's): statement of the result..
19. Idea of the proof of Theorem 4.3.
20. Theorem 4.6 (Continuity of the Itô-Lyons map): statement of the result.