Meeting: 1005, Newark, Delaware, SS 1A, Special Session on Homotopy Theory (in Honor of Donald M. Davis's and Martin Bendersky's 60th Birthdays)

1005-81-63   **Jungyoon Byun*** (`jbyun@math.upenn.edu`), Dept of Math, 209 South 33rd Street, Philadelphia, PA 19104. *Renormalization, Bonsai and Homological Algebra.* Preliminary report.

As an approximation to the Hopf algebra introduced by Connes-Kreimer, we construct a new Hopf algebra structure by considering actual shapes of Feynman diagrams. It has a basis consisting of forests of tree diagrams having a finite upper bound of their branching numbers. We call such a tree diagram 'bonsai', show that it involves an operad structure, derive from that some cochain complex structures which are quite natural from the viewpoint of operad theory, and present some results on their homological algebra. (Received January 25, 2005)