Lehrstuhl für Schaltungsentwurf
Fakultät für Elektrotechnik und Informationstechnik
Technische Universität München

Design of a Current (or Charge?) Feedback Amplifier for a piezoelectric Audio sensor

Master Thesis at Chair of Circuit Design

Background*:*
For a piezoelectric sensor a fully differential charge-to-voltage amplifier is under development where a fully differential amplifier with capacitive based feedback will be used. One main optimization aspect is the signal-to-noise ratio (SNR). To get a high SNR, all capacitances of this system should be considered, also the opamp input capacitance. Because of the low impedance node at the input of the opamp the input capacitance is very low compared to other topologies. But this system can have stability problems.

What does the work look like?
First of all, a system level has to build to understand the feedback and influence of all components. One main aspect is the comparison of the stability of the whole system. Then an amplifier with some ideal components have to build. The influence of the noise source of the input transistor to the output has to be investigated and minimized.

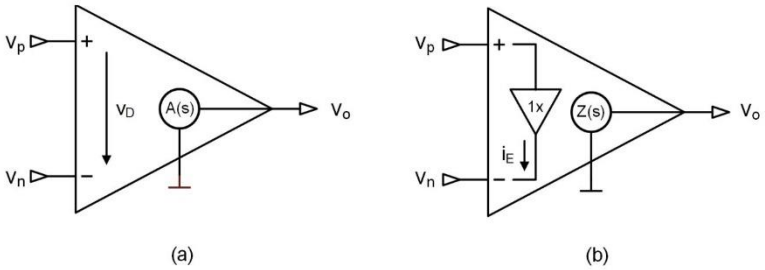

Figure 1 Voltage Feeback (a) and Current Feedback (b) Amplifier [1]

[1] L. Sant et al*., "*A current-feedback amplifier with programmable gain for MEMS microphone read-out circuits*," in IEEE*

What are good pre-requisites for starting this work?

- Lecture “Analog and Mixed-Signal Electronics”
- Basic knowledge in Amplifier Design
- Basic knowledge in Control theory and Circuit stability
- Fun with analog circuit design

Interessted?	→ contact:	Marco Schewa, M.Sc. Room N5320 **marco.schewa@tum.de**