

# Investigation of AI Algorithms for Design Automation

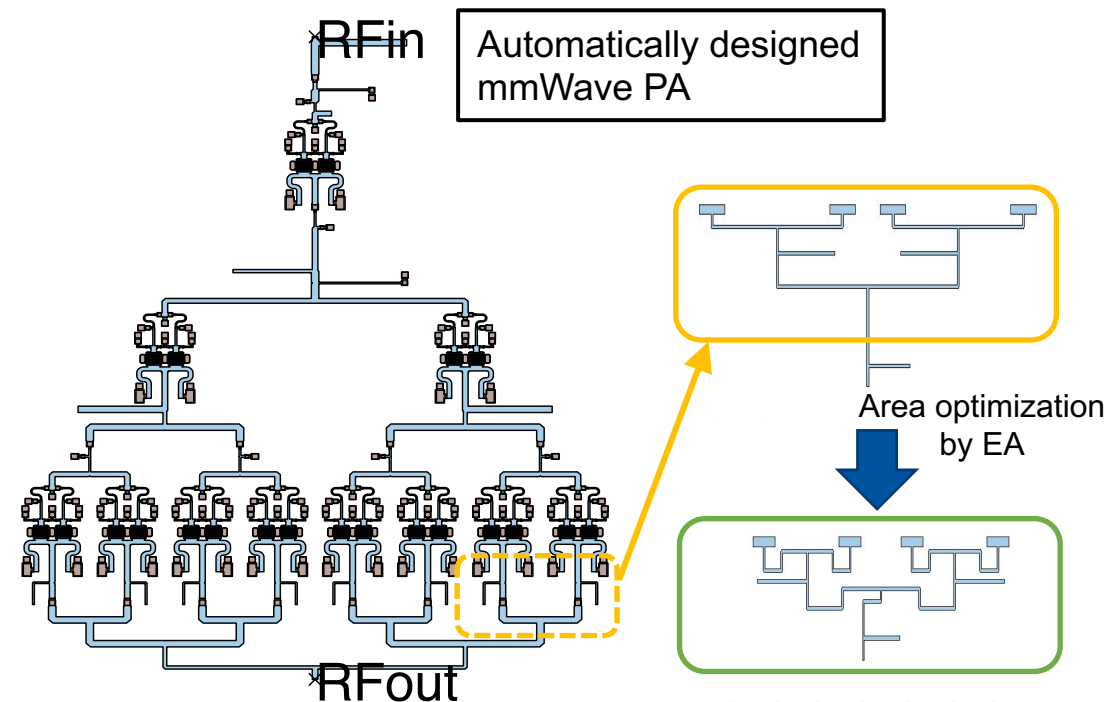
## Background

In the field of electronic design and development, Automated Circuit Design (ACD) has become a crucial tool for faster, more efficient, and cost-effective circuit design processes. Within the last years, the chair of High Frequency Electronics has developed a universal and fast approach for the synthesis of complex RF-power amplifier and low noise amplifier circuits. The automation tool shall be extended with further AI (artificial intelligence) algorithms for global optimization of the circuits, as demonstrated in the figure. Therefore, AI algorithms like evolutionary algorithms (EA) or reinforcement learning (RL) shall be investigated and implemented into the design automation.

## Tasks

The students' task is to investigate AI algorithms for the design automation tool developed at the chair. For this, the student needs to work through the following tasks:

- Literature survey on AI algorithms (EA, RL etc.)
- Implementation of the AI algorithm extension for the design automation
- Carrying out case studies based on the implemented extension by synthesizing various PAs and LNAs for various applications (frequency, power level, technology node etc.)



## Contact

Eduard Heidebrecht  
Kopernikusstraße 16, 52074 Aachen  
ICT cubes, 5th Floor, Room 540  
+49 241 80 24647  
[eduard.heidebrecht@hfe.rwth-aachen.de](mailto:eduard.heidebrecht@hfe.rwth-aachen.de)  
[www.hfe.rwth-aachen.de](http://www.hfe.rwth-aachen.de)