# Chenxuanyin Zou

zcxy0218@gmail.com · (+86) 188-4248-8849 · Homepage · 02.18.1998

## Education

**Northeastern University (985)**, China, Shenyang — Sep. 2020 – present

*State Key Laboratory of Synthetical Automation for Process Industries*
*Acadamic Master* in Control Theory and Control Engineering (top 5) – comprehensive ranking 1/31
*Supervisor*: Jun Fu (Cheungkong Scholar)

**Northeastern University (985)**, China, Shenyang — Sep. 2016 – Jun. 2020

*B.S.* in Automation – (Lang shijun's Automation Experimental Class–the best class) GPA: 3.85/5.0

## Research Interests

1. **Multiobjective optimization**: focus on efficient a priori Newton-type multiobjective algorithms for constrained multiobjective problems, propose an upper bounding problem of the individual descent of one objective with quadratic convergence and give a
2. **Semi-infinite programming**: construct a finite-constraint upper bounding problem to approximate the semi-infinite problem and iterate the parameters in the problem such that it converges to a sub-optimal solution.
3. **Optimal control**: mainly utilize the control vector parameterization (CVP) technique and the maximum principle to solve the optimal control problems.
4. **Dynamic optimization of nonlinear systems**: apply the semi-infinite programming algorithm to optimal control and integrate it with dynamic multiobjective optimization problems of nonlinear systems with path constraints to control the Fed-batch bioreactor and Lysine Fermentation.

## Publications

1. *Jun Fu, **Chenxuanyin Zou**, Mingsheng Zhang, Xinglong Lu, and Yuzhe Li*,
   Multiobjective dynamic optimization of nonlinear systems With path constraints.
   IEEE Transactions on Systems, Man, and Cybernetics: Systems
   DOI: 10.1109/TSMC.2022.3201685
2. *Jun Fu, **Chenxuanyin Zou***
   An alternated direction sequential quadratic method for constrained multiobjective optimization.
   Under writing and preparing to publish on *Mathematical Programming* or *SIAM J. Optim.*

## Academic Experience

### MCM/ICM – *Meritorious Winner* — 2018 – 2019

**Aim**: Design an escape plan for Louvre Museum for terrorist attacks.

- Utilize the charging and discharging process of capacitance to approximate the process of people entering and leaving the rooms, design a charged circuit according to the building structure of the Louvre Museum, then discharge it. The best escape plan is the path through which electrons move in the circuit.

### Research in the State Key Laboratory — 2019 – 2023

- Integrate the heuristic algorithms and deterministic algorithms to adopt their advantages. I use the gradient-type method to converge to the local minimum because of their efficiency and the genetic algorithm (GA) to jump out of the local part through the mutation operator.
- Integrate the multiobjective optimization algorithms and the path constraints handling technique to solve the optimal control problems of nonlinear dynamic systems.
- Propose an alternated direction method for constrained multiobjective optimization problems.

**Internship and Hand-on Experience in Courses** 2018 – 2021

- China Baowu Steel Group Corporation Limited & SIASUN Robot & Automation CO., LTD
- Quancer experimental equipment with MATLAB (Eg. coupled tank, inverted pendulum, etc.)
- Control of an experimental blowing machine with PLC (SIEMENS & ABB).

**Academic Material Writing Experience** 2021 – 2022

For supervisor

- First Prize of Natural Science Award of the Ministry of Education
- The nomination form for IEEE Fellow

## Awards and Scholarships

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|---|---|---|
| *Third-class Scholarship*, | Undergraduate Scholarship of NEU (30%)×3 | 2016-2019 |
| *Second-class Scholarship*, | Undergraduate Scholarship of NEU (10%) | 2019-2020 |
| *First-class Scholarship*, | Graduate Scholarship of NEU (40%)×3 | 2020-2023 |
| *Suzhou Industrial Park Scholarship*, | Enterprise Scholarship (1/31) | 2022-2023 |
| *Meritorious Winner*, | MCM/ICM (13%) | 2019-2020 |

## Related Courses

- Numerical analysis(97), Fundamental of modern control theory(95), Process control systems(95), Introduction to modern robust control(100), Optimal control(96), Modern control systems I-II (I-95, II-93), Design of computer control systems for industrial processes(92), Data-driven intelligent modeling methods(89), Linear and non-linear control systems, and Fundamental of Artificial Intelligence(87), etc.

## Others

- Fabrication of welding circuit board - made a voice controlled vehicle (Altium Designer, Multsim, etc.)
- Video production - made a 3-minute introductory video (Adobe Premiere Pro)
- Driving skills - got the driver's license in 2016.