

# مبانی یادگیری ماشین

## Intro to Machine Learning

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دانشکده مهندسی برق و کامپیوتر دانشگاه تهران

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موضوع این جلسه

مروری بر روش های بهینه سازی

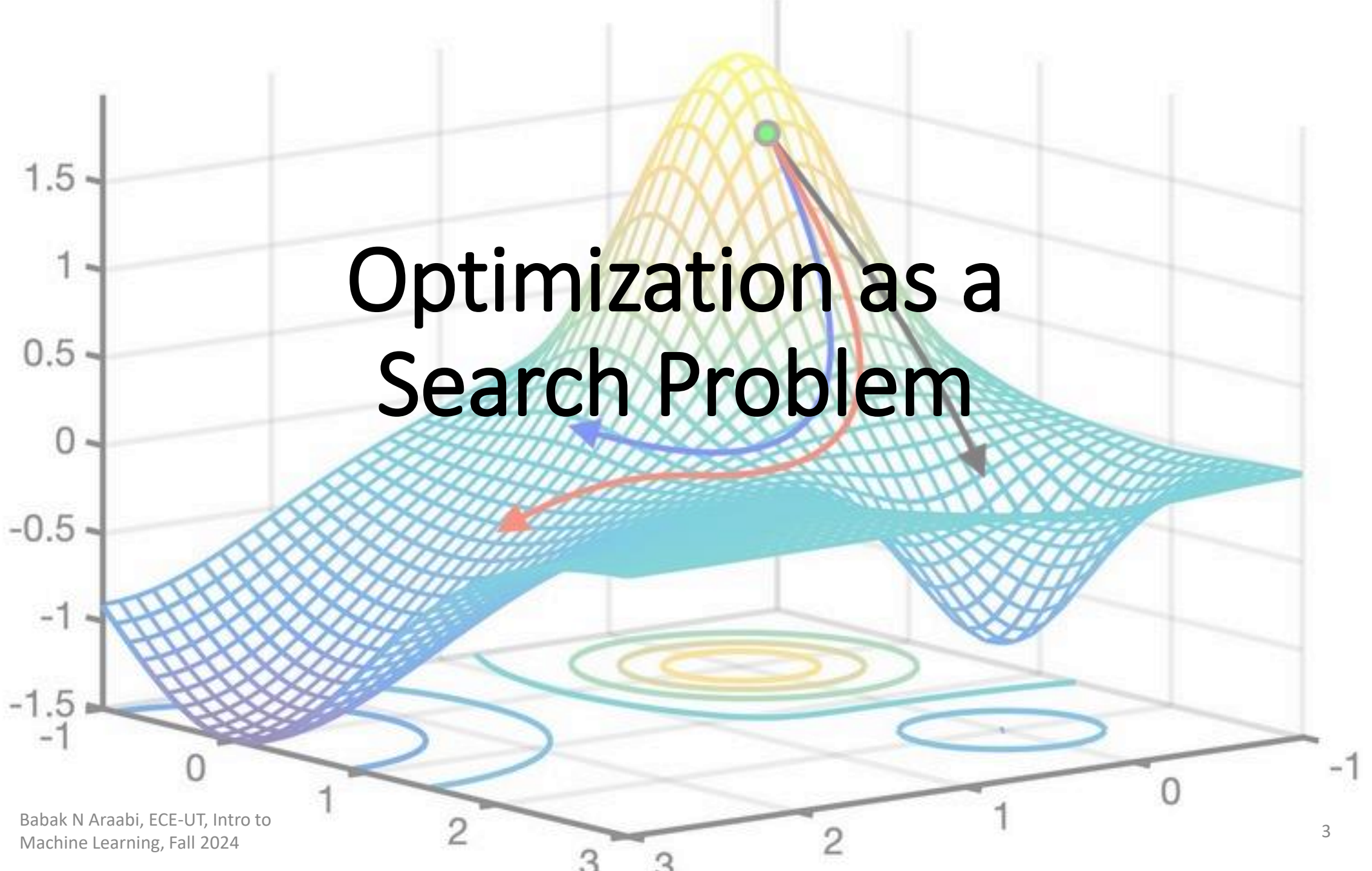
جلسه سوم

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# Optimization as a Search Problem





# A simple Local Random Search

1. Start from an initial point
2. Take small steps around the initial point randomly, to find a descent direction.
3. then take that descent direction for as many steps as possible, until it is not descent anymore.
4. Now repeat step 2 until a termination condition met.

# Exhaustive Search

for Global Optimization

# Grid Search

for Global Optimization

# Random Search & Random (Direction) Search

for Global Optimization

# Direct Search

Local Search/Optimization  
with No Need for Gradient



# Nelder–Mead method

or **Downhill Simplex Method**

- A direct search method
- A derivative-free search
- A local search method
- A simplex is a triangle

# Hooke-Jeeves method

or **Pattern Search Method**

- A direct search method
  - A derivative-free search
  - A local search method
- Let Start with an orthogonal basis to search the space

