

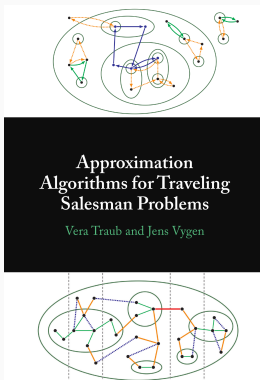
Hauptseminar Diskrete Optimierung

Approximationsalgorithmen für das Rundreiseproblem

Wintersemester 2025/2026

Approximationsalgorithmen für das Rundreiseproblem

Quelle: Ausgewählte Kapitel aus: V. Traub, J. Vygen: *Approximation Algorithms for Traveling Salesman Problems*, Cambridge University Press 2025.



How the Seminar runs

Each talk shall run as follows:

1. Part 1 (10–20 minutes)

Introduce the topic.

What will be the main results?

Why are they important and interesting?

Embed your topic into a broader context, e.g., by showing connections to other talks in this seminar or related results in the literature.

2. Questions to the audience

Ask one or two (multiple-choice) questions to check whether the audience has understood the key concepts.

This is also a good opportunity for the audience to ask questions.

- Main talks: Mo, 14-16
- Rehearsal talks: Mo, 16-18
- Seminarraum, Lennéstr. 2 (Arithmeum)

How the Seminar runs

Each talk shall run as follows:

1. Part 1 (10–20 minutes)
2. Questions to the audience
3. Part 2 (55–65 minutes)

Explain proofs, but focus on the main ideas rather than detailed calculations.

4. Discussion (15 minutes)

Questions of the audience to the speaker. Everyone should participate in the discussion!

The two parts of the talk together must not exceed 75 minutes.

If you use definitions or proofs from previous talks, remind the audience by repeating relevant things briefly.

What we expect from you

- Understand every aspect of your topic
- Prepare your talk on the assigned topic carefully, including questions to the audience.
- Prepare a 1- or 2-page summary of your talk, with the most important definitions and results. Distribute hardcopies of this before your talk to the audience.
- Give a rehearsal talk about 2–3 weeks before your main talk.
- Participate actively in the discussions in the seminar.

Besides the text assigned to you, it is usually necessary and always helpful to study further sources (e.g., read other papers).

Assignment of topics and registration

If you want to participate in this seminar, send an e-mail to Ulrich Brenner (brenner@dm.uni-bonn.de) with your name and your favorite topics no later than

Monday, July 21, 9:00.

A few days later we will inform you by e-mail about the assignment of the topics.

After the assignment you have one week for the final registration. After that we may give your place to another student.

In addition, you have to register in BASIS in early October (before the seminar begins).

Each participant will be assigned an advisor (usually one of our PhD students) who can help with questions.

Topics of the Talks

Please read pages 1–28 of the book before the seminar.

- ① Wolsey's Theorem (Sections 2.3 und 2.4)
- ② Splitting Off (Sections 2.5 bis 3.2)
- ③ ATSP Integrality Ratio (Sections 3.5 und 3.6)
- ④ Removable Pairings (Sections 12.1 bis 12.3 und 12.6)
- ⑤ 13/9-Approximation for Graph TSP (Sections 12.4 und 12.5)
- ⑥ Ear-Decompositions (Sections 13.1 bis 13.3 bis Seite 286)
- ⑦ Frank's Theorem and Nice Ear-Decompositions (Section 13.3 und 13.4, Seiten 287 bis 292)
- ⑧ 7/5-Approximation for Graph TSP (Sections 13.4 und 13.5, Seiten 292 bis 299)
- ⑨ Path TSP (Sections 14.1 und 14.2)
- ⑩ Gao's Theorem (Sections 14.3 bis 14.5)