# Potential Research Topics for Bachelor Thesis Supervision
# Các Chủ Đề Nghiên Cứu Làm Khóa Luận Tốt Nghiệp Đại Học

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Ngày 6 tháng 6 năm 2025

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# Preface

Các đề tài nghiên cứu tiềm năng cho Khóa Luận Tốt Nghiệp cho sinh viên Khoa Công Nghệ, UMT.

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# Mục lục

# Chương 1

# Combinatorial Neural Networks & Optimization Problems in Graph Theory

1. **Keywords.** Combinatorial neural networks.

2. **Student.** Phan Vĩnh Tiến [PVT].

**Resources – Tài nguyên.**

1. Quentin Cappart, Didier Chètelat, Elias B. Khalil, Andrea Lodi, Christopher Morris, Petar Veličković. *Combinatorial Optimization & Reasoning with Graph Neural Networks.*

2. Irwan Bello, Hieu Pham, Quoc V. Le, Mohammad Norouzi, Samy Bengio (Google Brain). *Neural Combinatorial Optimization with Reinforcement Learning.* ICLR2017.

3. Andoni I. Garmendia, Josu Ceberio, Alexander Mendiburu. *Neural Combinatorial Optimization: a New Player in the Field.*

4. Boris Goldengorin. *Optimization Problems in Graph Theory.*

# Chương 2

# Computer Music

## Contents

1. **Keywords.** Automatic music transcription, music generation.

2. **Student.** Võ Ngọc Trâm Anh [VNTA].

**Resources – Tài nguyên.**

1. [BJP20]. Jean-Pierre Briot, Gaëtan Jadjeres, François-David Pachet Pachet. *Deep Learning Techniques for Music Generation.*

2. [Mül15; Mül21]. Meinard Müller. *Fundamentals of Music Processing – Using Python & Jupyter Notebooks.*

## 2.1 Automatic Music Transcription (AMT)

**Keywords.**

## 2.2 Music Generation

**Keywords.** Stochastic, random Boltzmann machine (RBM).

# Chương 3

# Computer Vision

## Contents

**Resources – Tài nguyên.**

1. Lý Quốc Ngọc. *Lecture: Introduction to Image Processing & Applications – Bài Giảng: Nhập Môn Xử Lý Ảnh & Ứng Dụng.*

2. David Tschumperle, Christophe Tilman, Vincent Barra. *Digital Image Processing with C++: Implementing Reference Algorithms with the CImg Library.*

3. Mark S. Nixon, Alberto S. Aguado. *Feature Extraction & Image Processing for Computer Vision.* 4e.

4. Manas Kamal Bhuyan. *Computer Vision & Image Processing Fundamentals & Applications.*

5. Rafael C. Gonzalez, Richard E. Woods. *Digital Image Processing.* 4e.

6. Martin McBridge. *Image Processing in Python.*

## 3.1   Handwritten Digit Classification

# Chương 4

# Scheduling Problems

1. **Keywords.** Deterministic scheduling problem, stochastic scheduling problems.

2. **Student.** NGUYỄN NGỌC THẠCH [NNT].

**Resources – Tài nguyên.**

1. [Pin22]. MICHAEL L. PINEDO. *Scheduling: Theory, Algorithms, & Systems.*

# Chương 5

# Miscellaneous

# Tài liệu tham khảo

[BJP20]   Jean-Pierre Briot, Gaëtan Jadjeres, and François-David Pachet. *Deep Learning Techniques for Music Generation*. Computational Synthesis & Creative Systems. Springer, 2020, p. 284.

[Mül15]   Meinard Müller. *Fundamentals of music processing*. Audio, analysis, algorithms, applications. Springer, Cham, 2015, pp. xxix+487. ISBN: 978-3-319-21944-8; 978-3-319-21945-5. DOI: 10.1007/978-3-319-21945-5. URL: https://doi.org/10.1007/978-3-319-21945-5.

[Mül21]   Meinard Müller. *Fundamentals of music processing—using Python and Jupyter notebooks*. Second edition [of 3382223]. Springer, Cham, [2021] ©2021, pp. xxxi+495. ISBN: 978-3-030-69807-2; 978-3-030-69808-9. DOI: 10.1007/978-3-030-69808-9. URL: https://doi.org/10.1007/978-3-030-69808-9.

[Pin22]   Michael L. Pinedo. *Scheduling: Theory, Algorithms, and Systems*. 6th edition. Springer, 2022, pp. xvii+698.