

# Video Processing

**Bi:**

Truong Nguyen



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Truong Nguyen

**Phiên bản trực tuyến:**  
< <http://voer.edu.vn/content/col10142/1.2/> >

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Đ biết thông tin về đóng góp cho các module có trong tài liệu này, xem tr. 12.

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# Chapter 1

## Quality Enhancement for Compressed Images and Videos<sup>1</sup>

### 1.1 Outline

1. Image and Video Compression
    - 1.1. Image compression: JPEG
    - 1.2. Video compression: MPEG and H26x
  2. Artifacts in Compression
    - 2.1. Spatial Artifacts: blocking and ringing
    - 2.2. Temporal Artifacts: mosquito and flickering
    - 2.3. Review on Methods for Quality Enhancement
  3. Spatial Filtering for Quality Enhancement
    - 3.1. Blocking Artifacts Reduction: DCT-based low-pass filtering
    - 3.2. Ringing Artifacts Reduction: fuzzy filtering
  4. Spatio-temporal Filtering for Quality Enhancement
    - 4.1. Motion Compensated Temporal Linear Filtering
    - 4.2 Adaptive Fuzzy Motion Compensated Spatio-temporal Filtering
  5. Extended Topics on Quality Enhancement
    - 5.1. Spatio-Temporal Filtering for Coding
    - 5.2. Data Pruning-based Compression
- The lecture is here<sup>2</sup>

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<sup>1</sup>This content is available online at <http://voer.edu.vn/content/m12698/1.2/>.

<sup>2</sup><http://voer.edu.vn/content/m12698/latest/Quality%20Enhancement%20for%20Compressed%20Images%20and%20Videos%202010-7-17.pdf>



## Chapter 2

# Lab Day 1 - QE<sup>1</sup>

The lab material is here<sup>2</sup> . The Matlab code is here<sup>3</sup> .

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<sup>1</sup>This content is available online at <http://voer.edu.vn/content/m16144/1.2/>.

<sup>2</sup>[http://voer.edu.vn/content/m16144/latest/Day 1 - Lab - Quality Enhancement.pdf](http://voer.edu.vn/content/m16144/latest/Day%201%20-%20Lab%20-%20Quality%20Enhancement.pdf)

<sup>3</sup><http://voer.edu.vn/content/m16144/latest/lab1mat.rar>



# Chapter 3

## Image/Video Super [U+2010] resolution<sup>1</sup>

### 3.1 Outline

1. Motivation and Conventional Approaches
2. Transform & Edge Directed Approaches
3. Power Spectral Density Based Approach
4. Edge[U+2010]Centric Processing Approach
5. Classification Based Approach
6. Kernel regression based methods

The lecture is here<sup>2</sup> .

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<sup>1</sup>This content is available online at <<http://voer.edu.vn/content/m13904/1.2/>>.

<sup>2</sup><http://voer.edu.vn/content/m13904/latest/lectures.rar>



## Chapter 4

# Lab Day 2 - Interpolations<sup>1</sup>

the lab material is here<sup>2</sup> . the matlab code is here<sup>3</sup> .

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<sup>1</sup>This content is available online at <http://voer.edu.vn/content/m16140/1.1/>.

<sup>2</sup>[http://voer.edu.vn/content/m16140/latest/Day 2 - Lab - InterpolationLab.doc](http://voer.edu.vn/content/m16140/latest/Day%20-%20Lab%20-%20InterpolationLab.doc)

<sup>3</sup><http://voer.edu.vn/content/m16140/latest/lab2mat.rar>



# Chapter 5

## Motion Compensated Frame Interpolation<sup>1</sup>

### 5.1 Outline

Motion Compensated Frame Interpolation

1. Introduction to frame rate up [U+2010]conversion
  - 1.1. Definition
  - 1.2. Frame rate up [U+2010]conversion methods
2. Techniques in MCFI
  - 2.1. Motion estimation
  - 2.2. Motion vector correction
  - 2.3. Overlapped block motion compensation
  - 2.4. Smooth motion vector interpolation
3. MCFI methods re[U+2010]estimating the MVs
  - 3.1. Bi[U+2010]lateral MCFI
  - 3.2. Hierarchical MCFI
4. MCFI methods using MVs available at the decoder
  - 4.1. Multi[U+2010]stage motion vector processing
  - 4.2. Motion vector processing based on trajectory curve analysis
5. Theoretical analysis of frame rate up conversion
6. Conclusions on MCFI methods

The note is here<sup>2</sup>

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<sup>1</sup>This content is available online at <<http://voer.edu.vn/content/m12694/1.2/>>.

<sup>2</sup><http://voer.edu.vn/content/m12694/latest/FRUC%202010-7-20.pdf>



# Chapter 6

## Lab Day 3 - MCFI<sup>1</sup>

The lecture is here<sup>2</sup> .

### 6.1 Matlab m-files

MATLAB m-files for lab 3 can be found here<sup>3</sup>

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<sup>1</sup>This content is available online at <<http://voer.edu.vn/content/m16139/1.2/>>.

<sup>2</sup>[http://voer.edu.vn/content/m16139/latest/Day 3 - Lab - Motion Compensated Frame Interpolation.pdf](http://voer.edu.vn/content/m16139/latest/Day%203%20-%20Lab%20-%20Motion%20Compensated%20Frame%20Interpolation.pdf)

<sup>3</sup><http://voer.edu.vn/content/m16139/latest/lab3mat.rar>

## Tham gia đóng góp

Tài liệu: *Video Processing*

Biên soạn bởi: Truong Nguyen

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**Video Processing**

The course covers the following topics on video processing 1/ Quality Enhancement for Compressed Images and Videos 2/ Image and Video Super-Resolution 3/ Motion Compensated Frame Interpolation

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