

CLASSIFICATION PROBLEM

BÀI TOÁN PHÂN LỚP DỮ LIỆU

- Nguyễn Hoàng Yến Như
- Nguyễn Trần Phúc Nghi
- Nguyễn Trần Phúc An
- Nguyễn Đức Anh Phúc
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- KS. Cao Bá Kiệt
- KS. Quan Chí Khánh An
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Classification: Definition

ĐỊNH NGHĨA BÀI TOÁN PHÂN LỚP

Classification: Definition

- Given a collection of datapoint (training set)
 - + Each datapoint is by characterized by a tuple (x, y) , where x is the attribute set and y is the class label.
 - x : independent variable, attribute, predictor, input.
 - y : dependent variable, class, response, output.
- Task: learn a model that maps each attribute set x into one of the predefined class labels y .

Examples

CÁC VÍ DỤ

Examples of Classification Task

Task	Attribute set x	Class label y
Categorizing email messages	Features extracted from email message header, footer and content	spam or non-spam
Identifying tumor cells	Features extracted from MRI scans	malignant cells or benign cells
Cataloging galaxies	Features extracted from telescope images	Elliptical, spiral, or irregular – shaped galaxies

Example: Categorizing email messages

CATEGORIZING EMAIL MESSAGES

Categorizing email messages



Categorizing email messages



Categorizing email messages

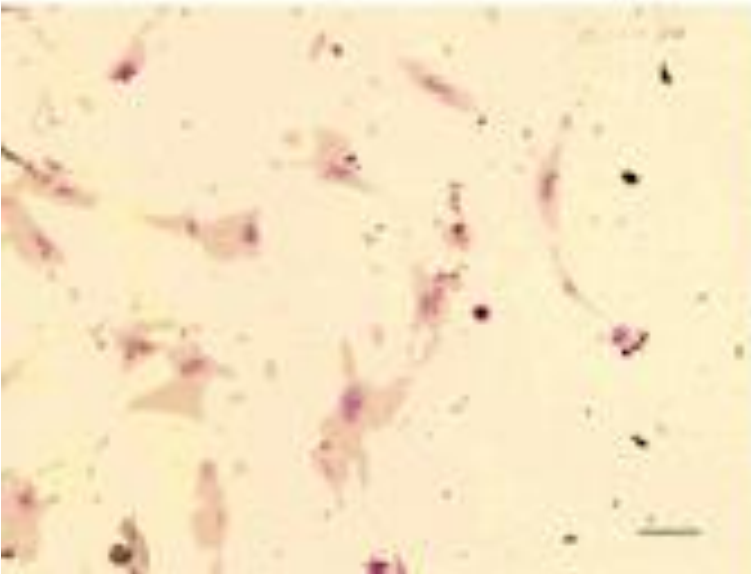


Example: Identifying tumor cells

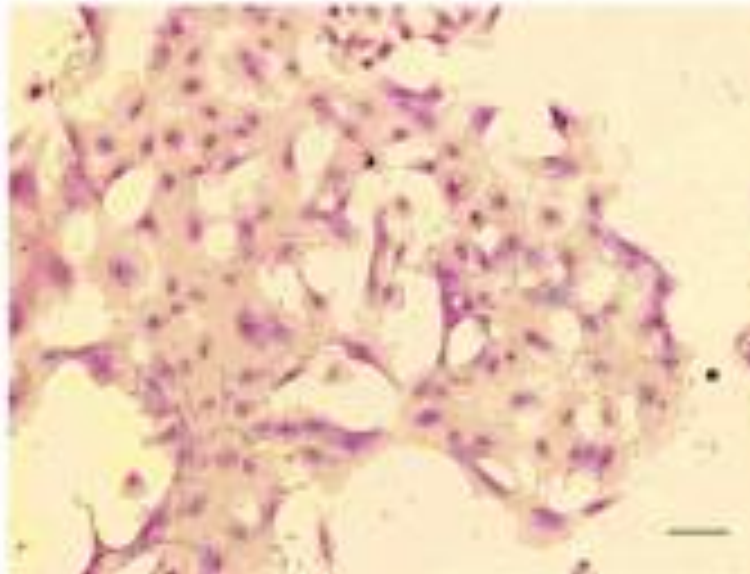
IDENTIFYING TUMOR CELLS

Identifying tumor cells

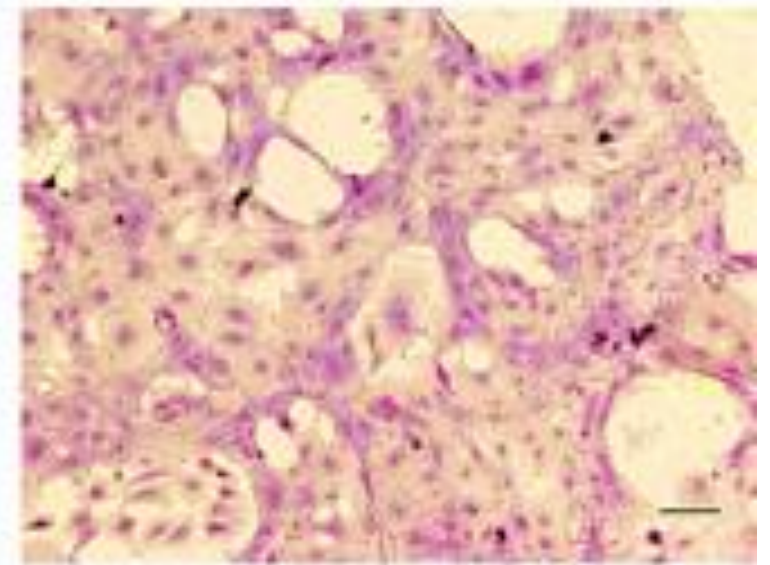
Normal cells



Benign Tumor cells



Malignant tumor cells



Identifying tumor cells



Example: Cataloging galaxies

CATALOGING GALAXIES

ToyerBee Telescope for Kids



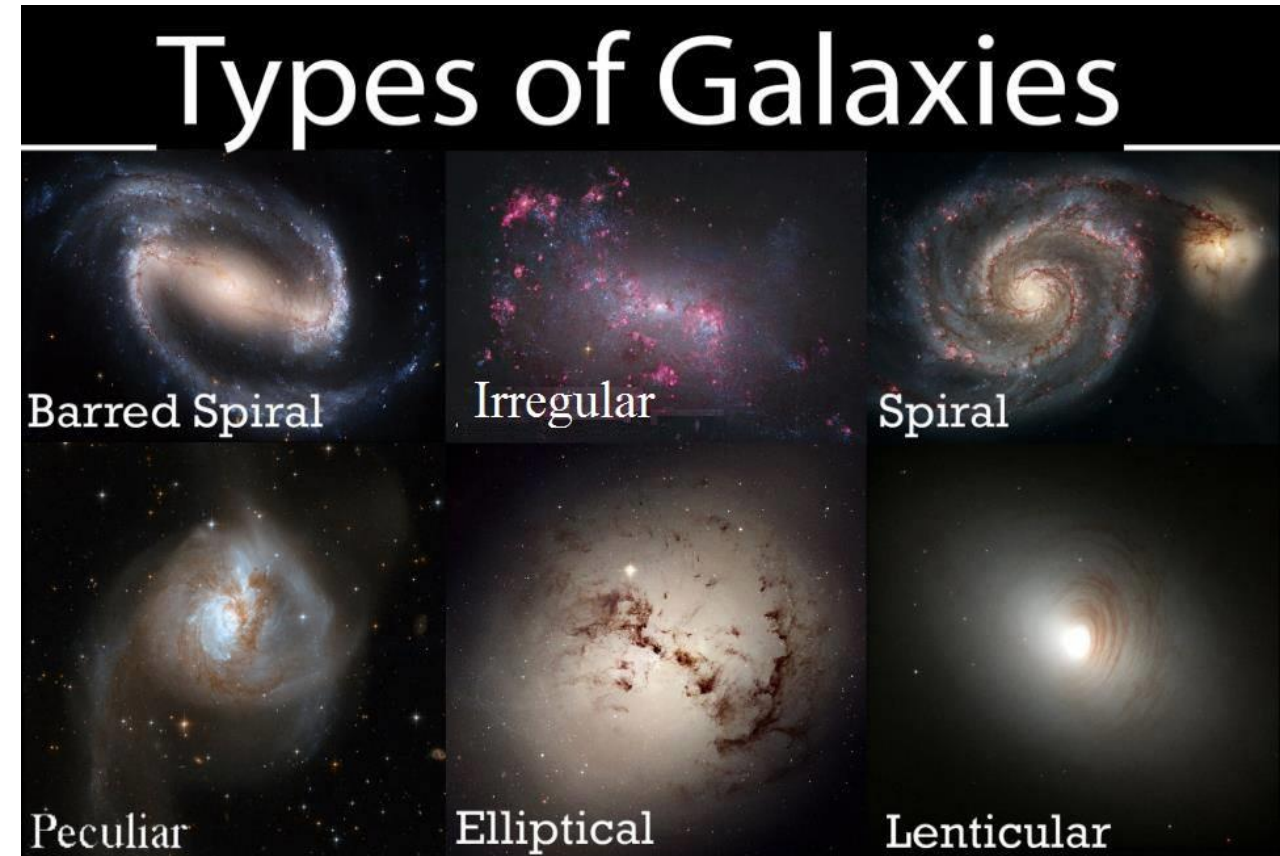
— <https://www.amazon.com/ToyerBee-Piece-Sinking-Dive-Grab/dp/B07PSCM51F>

Telescope images

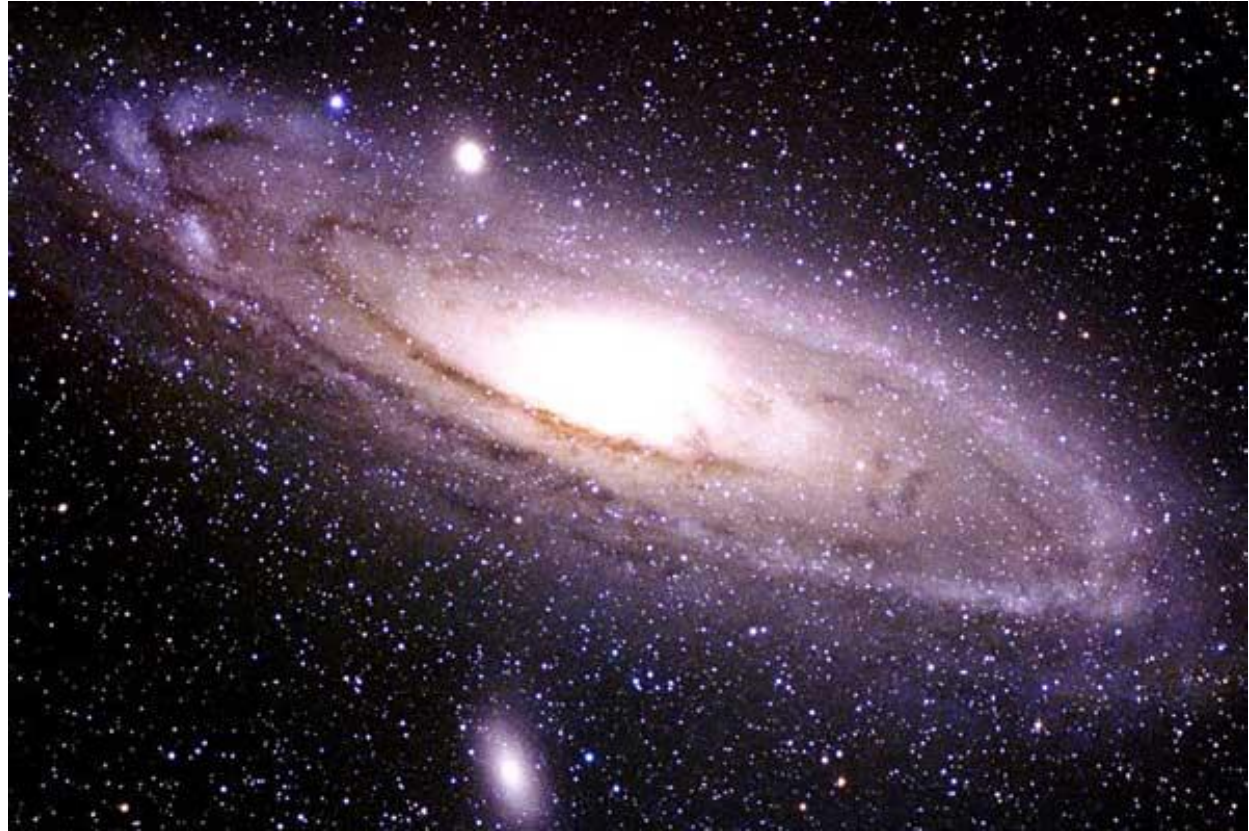


Types of Galaxies

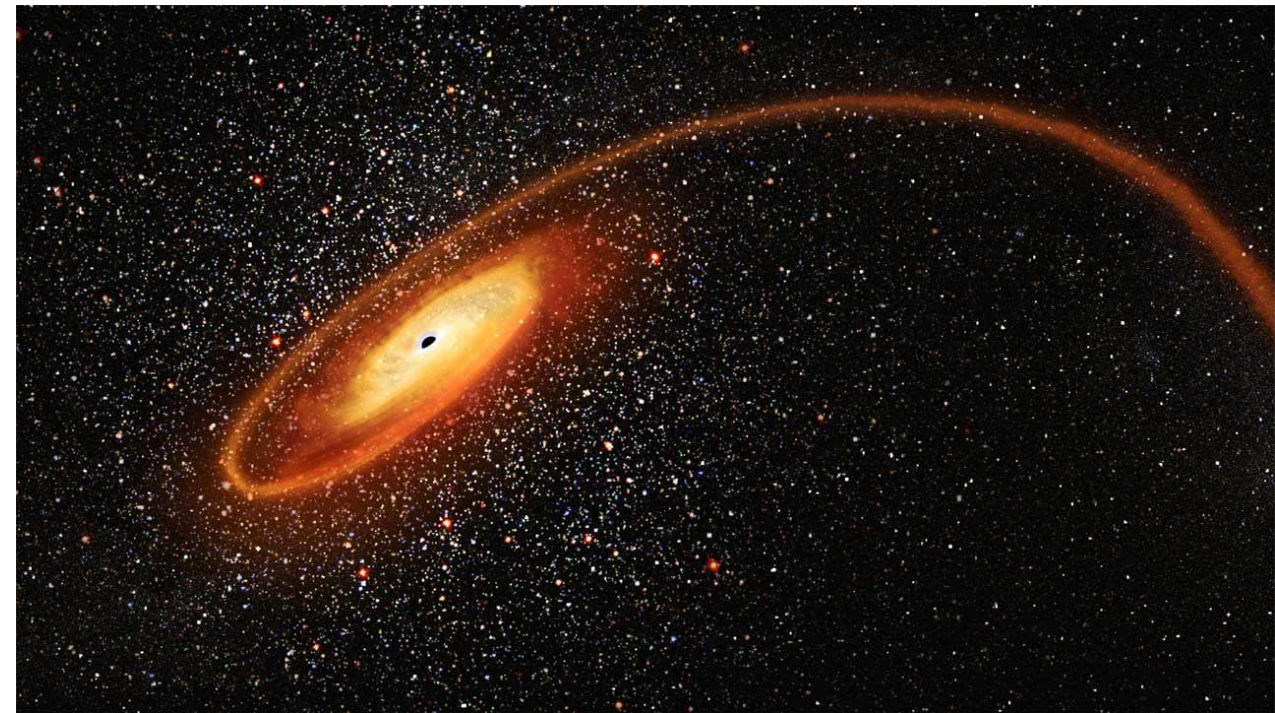
1. Spiral – Xoắn ốc.
2. Barred Spiral – Xoắn ốc có rào chắn.
3. Elliptical – Elip.
4. Lenticular – Thấu kính.
5. Irregular – Vô định hình.
6. Peculiar – Bất thường.



Elliptical galaxy



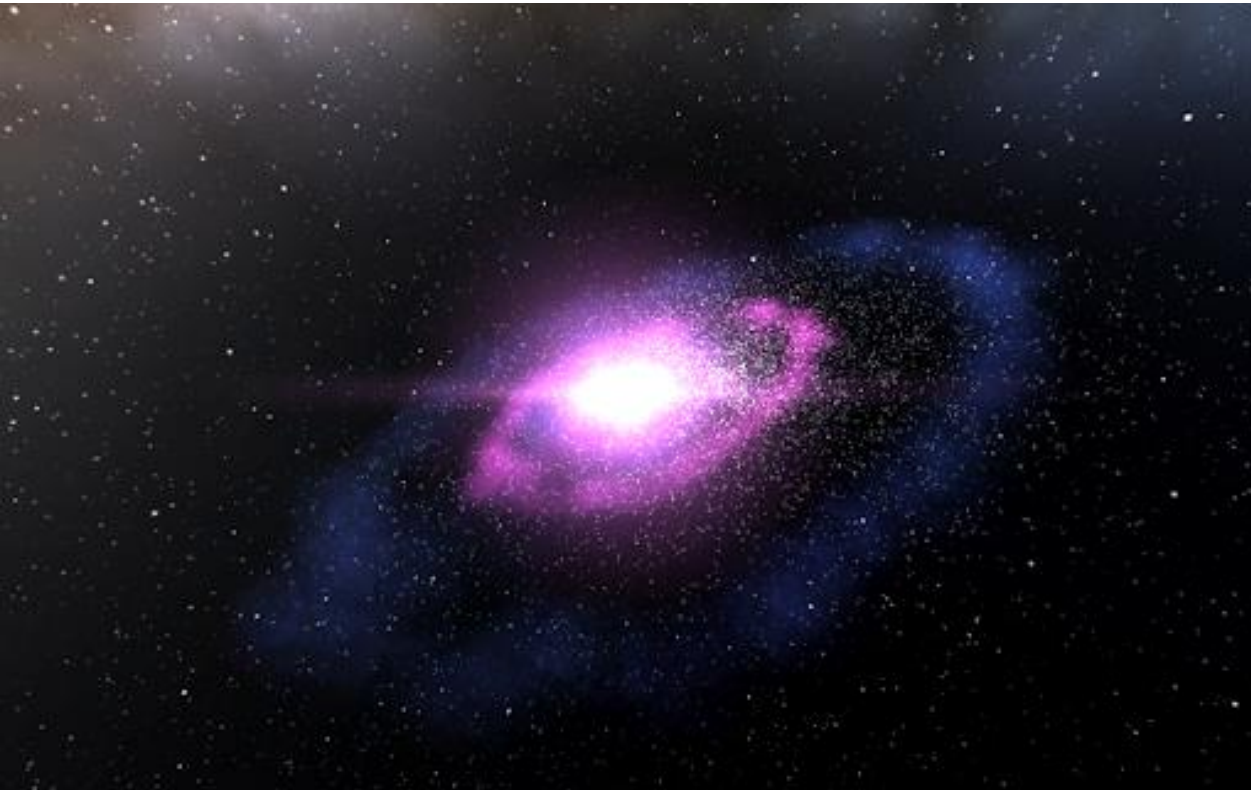
Spiral galaxy



Barred Spiral



Lenticular galaxy



Irregular galaxy



Peculiar galaxy



Classification Techniques

CÁC THUẬT TOÁN GIẢI QUYẾT BÀI TOÁN PHÂN LỚP DỮ LIỆU

Classification Techniques

1. Nearest – Neighbor
2. Logistic Regression
3. Decision Tree
4. SVM – Support Vector Machines
5. Kernel SVM
6. Naive Bayes
7. Random Forest Classification
8. Neural Networks
9. Deep Learning

Chúc các bạn học tốt
TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN TP.HCM

Nhóm UIT-Together
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