Breast Ultrasound Image Segmentation: an optimization approach based on super-pixels and high-level descriptors

Quality Control by Artificial Vision
4th June 2015

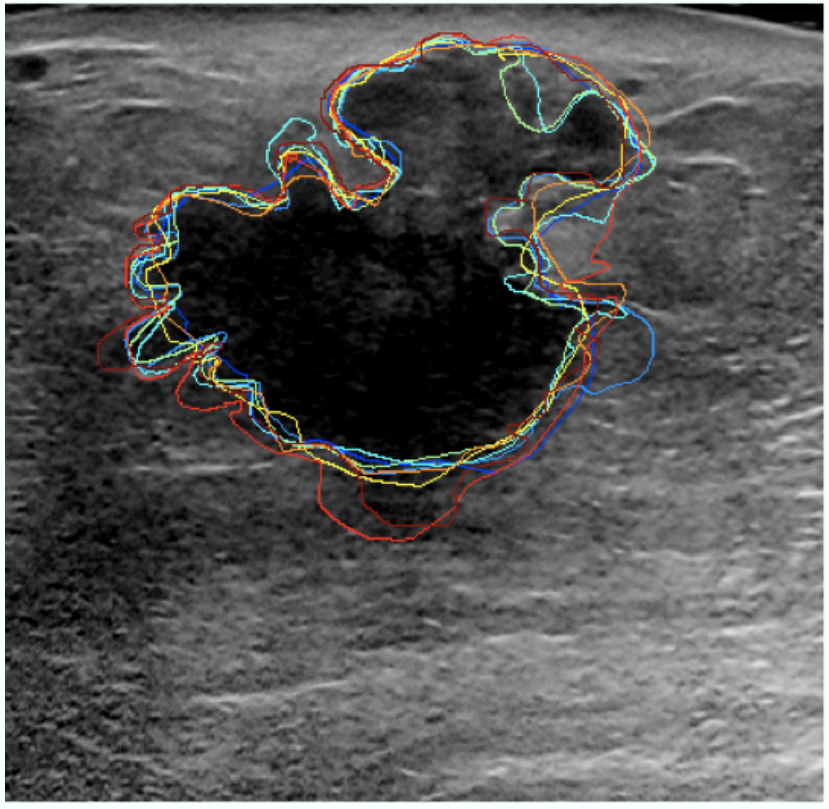
Joan Massich
joan.massich@u-bourgogne.fr

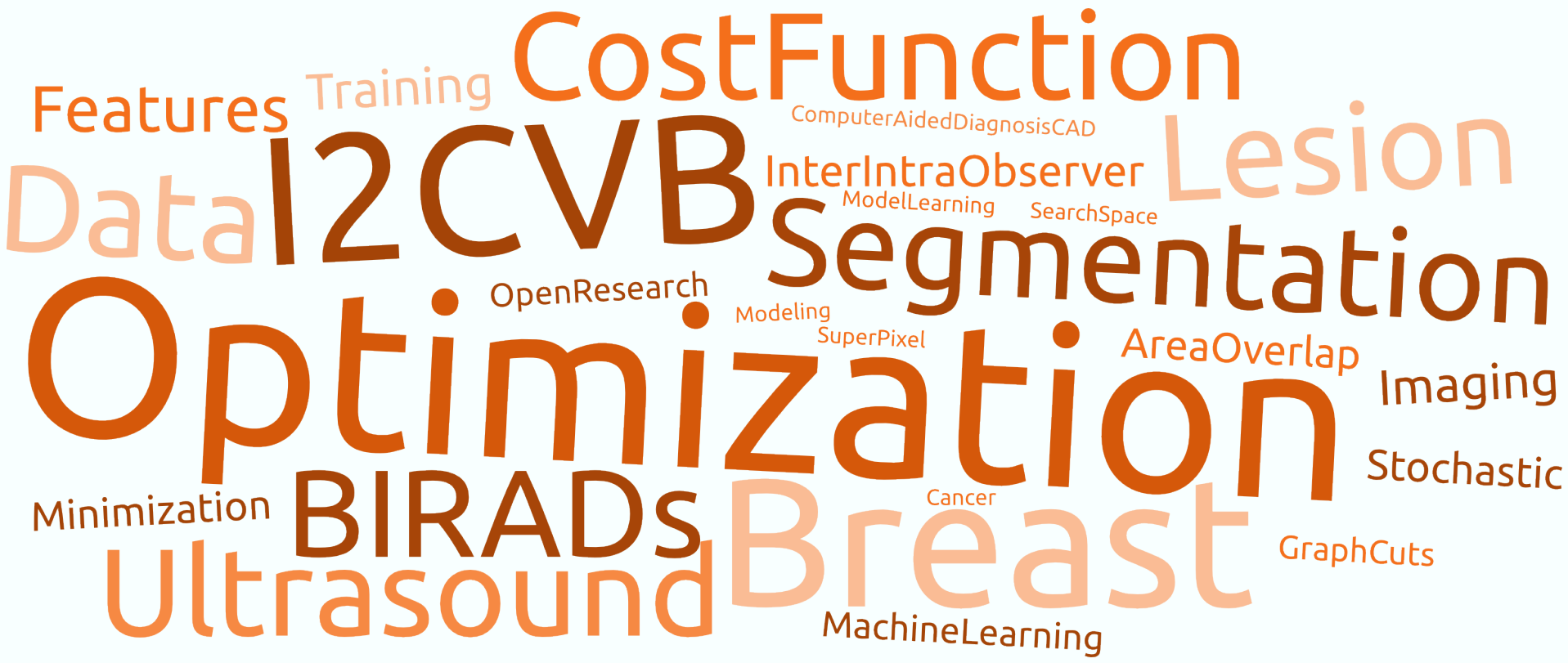
Université de Bourgogne

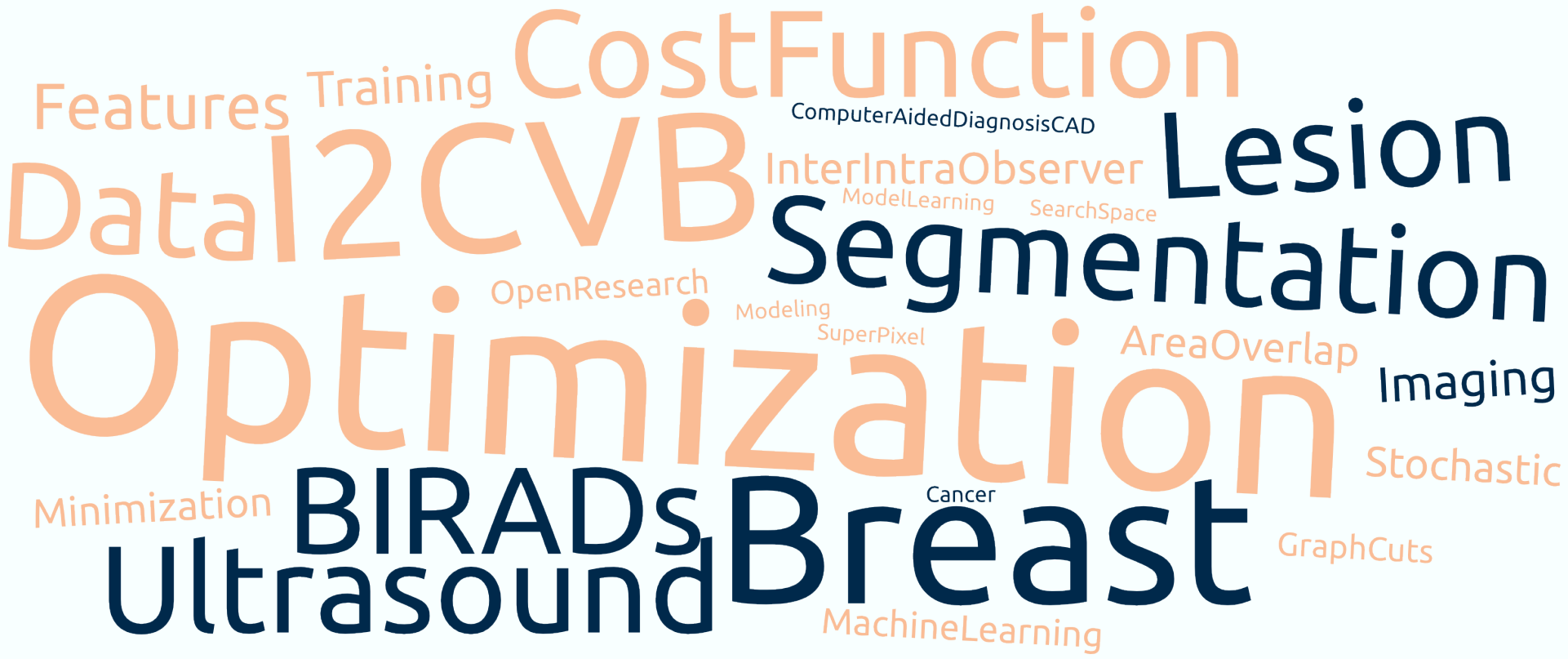
Features
Training
CostFunction
ComputerAidedDiagnosisCAD
Data
I2CVB
InterIntraObserver
Lesion
ModelLearning
SearchSpace
Segmentation
OpenResearch
Optimization
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
GraphCuts
Ultrasound
MachineLearning

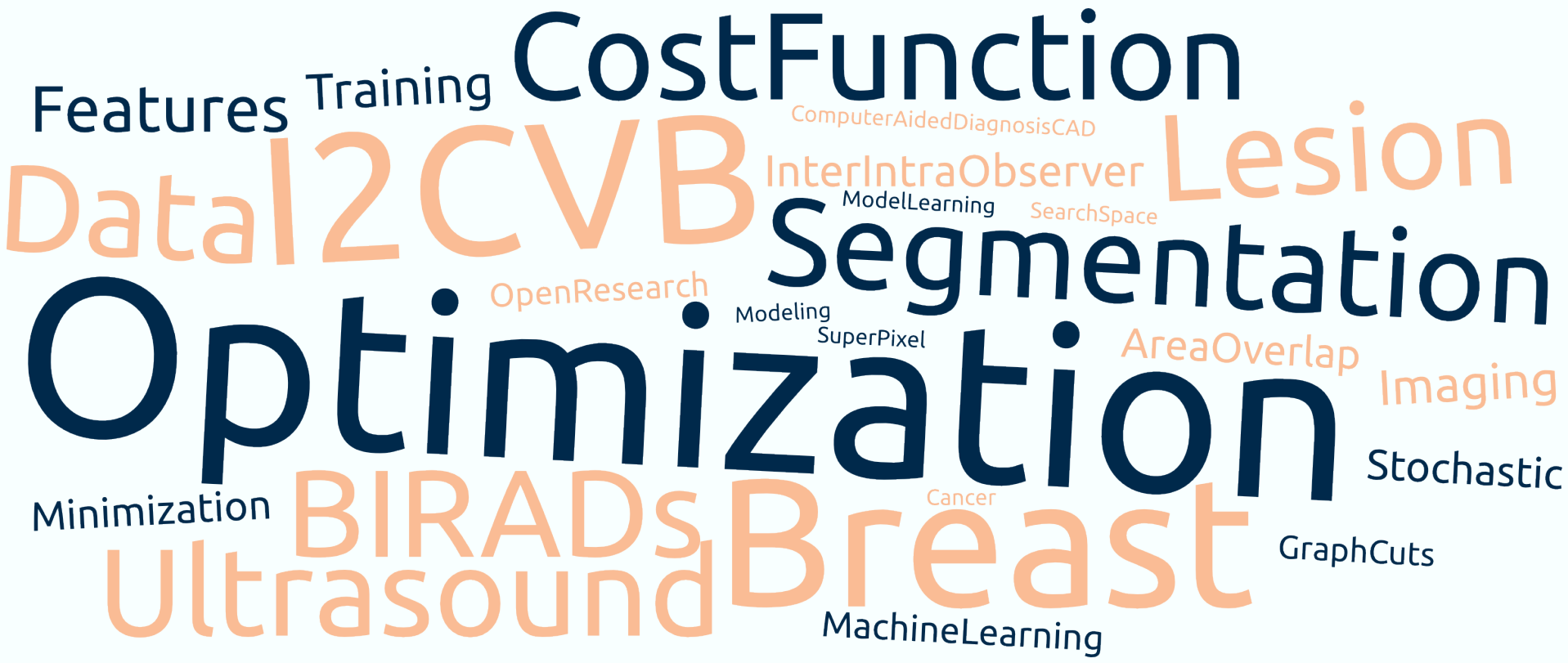
CostFunction
Features
Training
ComputerAidedDiagnosisCAD
Lesion
Data
I2CVB
InterIntraObserver
ModelLearning
SearchSpace
Segmentation
OpenResearch
Optimization
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
GraphCuts
Ultrasound
MachineLearning

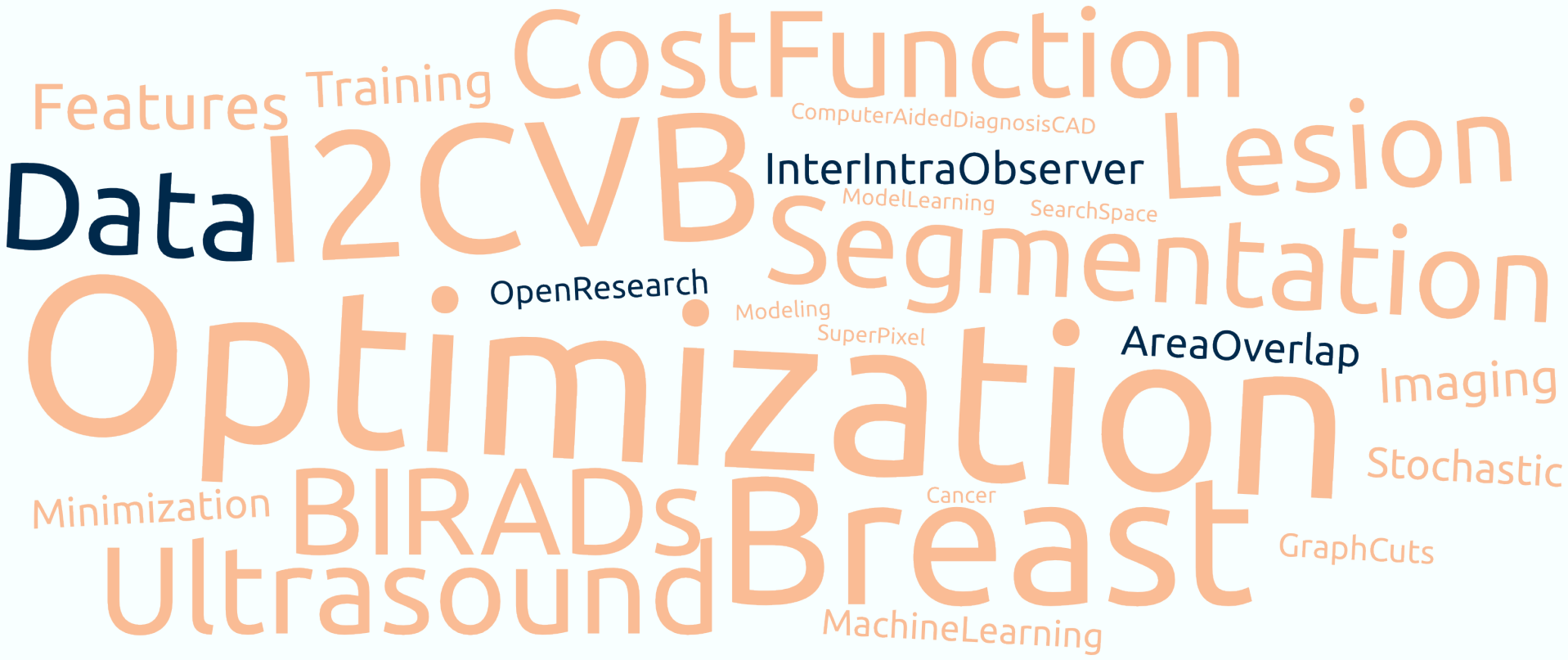
Breast Lesion Segmentation in US images




CostFunction
Features
Training
ComputerAidedDiagnosisCAD
Lesion
Data
I2CVB
InterIntraObserver
ModelLearning
SearchSpace
Segmentation
OpenResearch
Optimization
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
GraphCuts
Ultrasound
MachineLearning

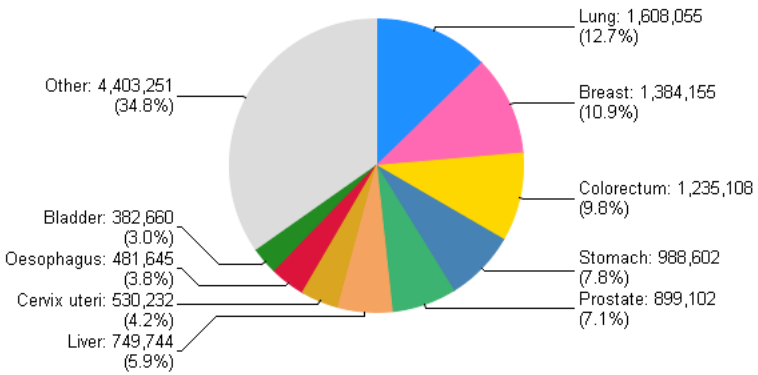

CostFunction
Features
Training
ComputerAidedDiagnosisCAD
Lesion
Data
I2CVB
InterIntraObserver
ModelLearning
SearchSpace
Segmentation
Optimization
OpenResearch
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
Ultrasound
GraphCuts
MachineLearning


CostFunction
Features
Training
I2CVB
Data
ComputerAidedDiagnosisCAD
Lesion
InterIntraObserver
ModelLearning
SearchSpace
Segmentation
OpenResearch
Optimization
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
GraphCuts
Ultrasound
MachineLearning

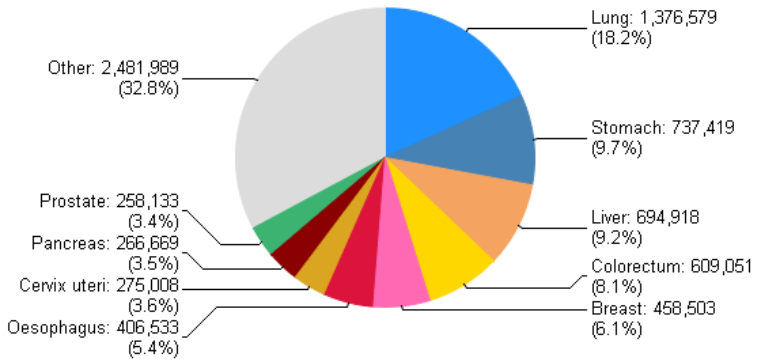

CostFunction
Features
Training
ComputerAidedDiagnosisCAD
Lesion
Data
I2CVB
InterIntraObserver
ModelLearning
SearchSpace
Segmentation
OpenResearch
Optimization
Modeling
SuperPixel
AreaOverlap
Imaging
Stochastic
Minimization
BIRADs
Cancer
Breast
GraphCuts
Ultrasound
MachineLearning

Motivations

Statistics



(a) # of cancer cases



(b) # of cancer deaths

Implications

- 1.4 million cases per year
- 10.9% of diagnosed cancers
- 5^{th} cause of cancer death
- 1^{th} cause of cancer death (females)