医用画像統計解析ソフトウェア：RadCloud

Imaging Research using RadCloud image analysis and Machine Learning

非薬事承認です。研究用途での使用のみ

固有値解析手法

数値解析手法

機械学習

ラジオミクス統計解析

臨床データセッティング

自動疑似論文出力

Developed by HuiyiHuiying Inc.

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国内総代理店：株式会社リジット

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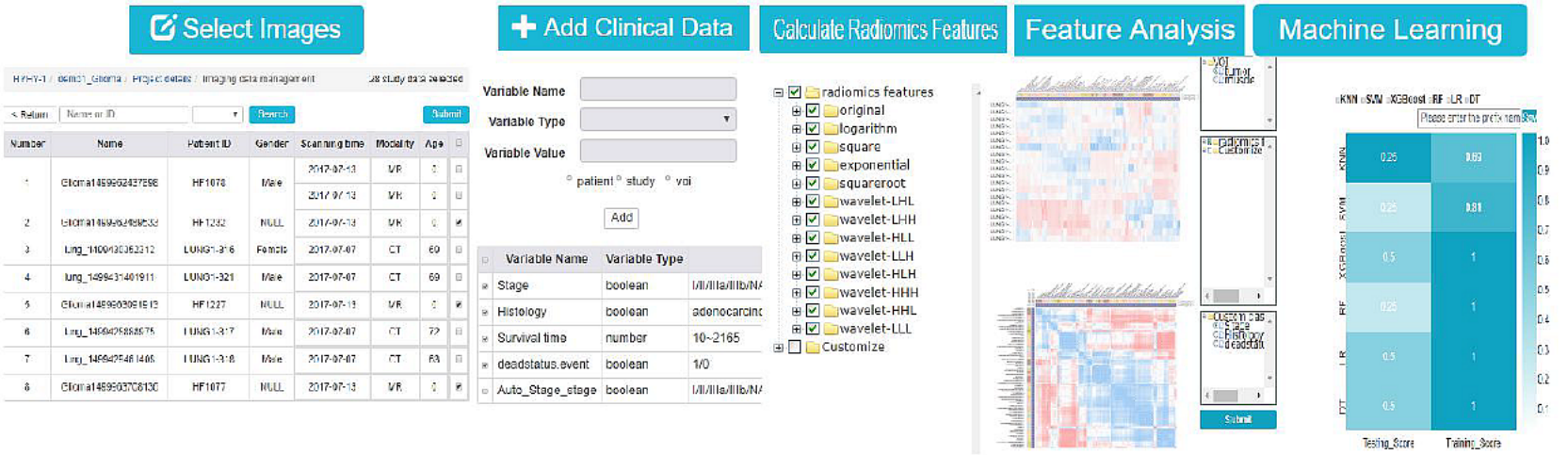
5 ステップによる自動DICOM-臨床情報　相互解析/学習システム



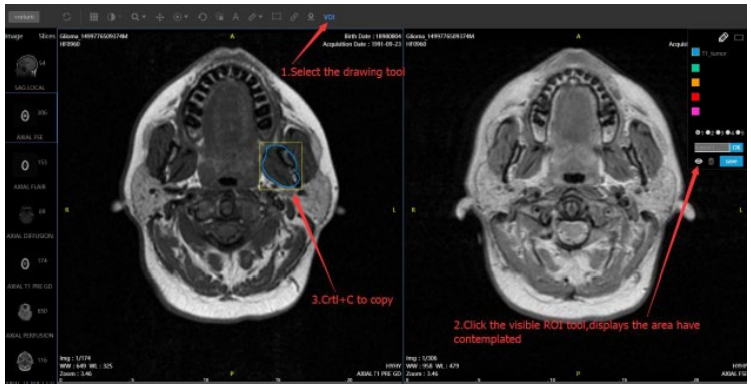
Add or remove patient information

Type can be added:boolen,number, string of clinical information

1039 characters to choose

Principal component analysis, correlation analysis and cluster analysis

6 kinds of classifier for machine learning



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Characters	Traditional imaging analysis	Radiomics cloud platform
Security	single storage, easy to lose data	cloud storage, promise data safety
Project management	decentralized management, repetitive labor	centralized management, imaging/clinical information can be used repetitively
Database	separated management	unified management
Quantitative index	several features, such as mean intensity, total volume, et al.	more than 1000 features, describing signal intensity, shape, texture, et al.
Analyzing method	T-test, ANOVA, ROC et al. low dimensional	SVM, kNN, XGBoost et al. high dimensional big data
Software tools	project information management, image viewing, quantitative index measuring, statistics software	cloud platform integrating all software from project information management to statistics
Calculating velocity	single node calculation	multiple nodes parallel distributed computing

画像データ特徴量は、1000インデックスを超える量

固有値解析方法
1.差異選択法
2.一変量特徴選択方法
3. Lassoアルゴリズム
4.主成分分析(PCA)
5. 相関解析
6.クラスタリング解析

数値解析方法
1.SVM
2.Logistic Regression
3. kNN
4.Decision Tree
5. Random Forest
6.XGBoost

画像診断の伝統的解析
1.T-test
2.ANOVA
3. ROC
など

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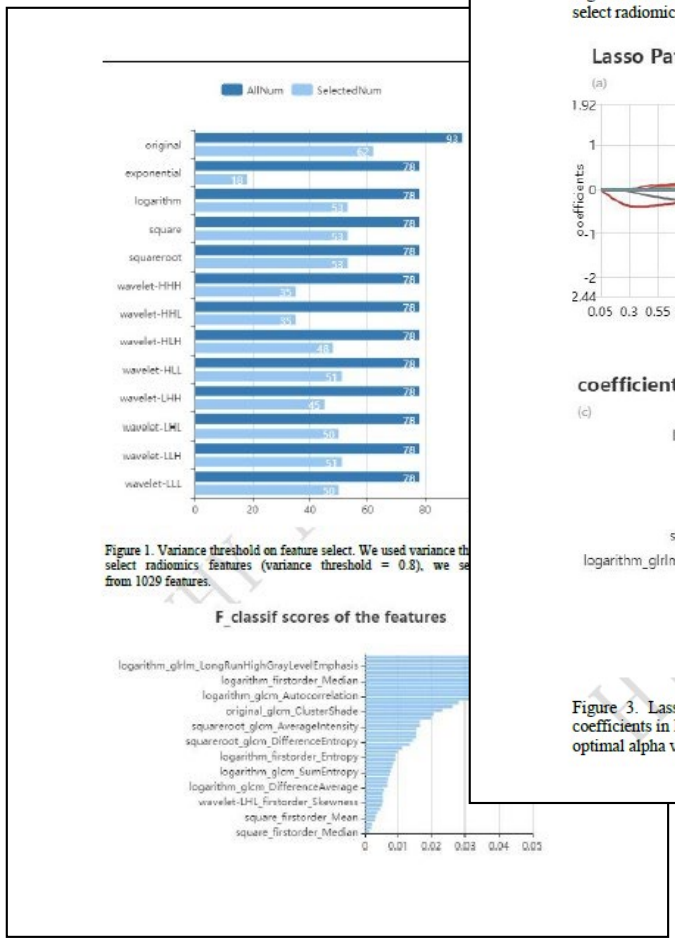

Figure 1. Variance threshold on feature select. We used variance th
select radiomics features (variance threshold = 0.8), we se
from 1029 features.

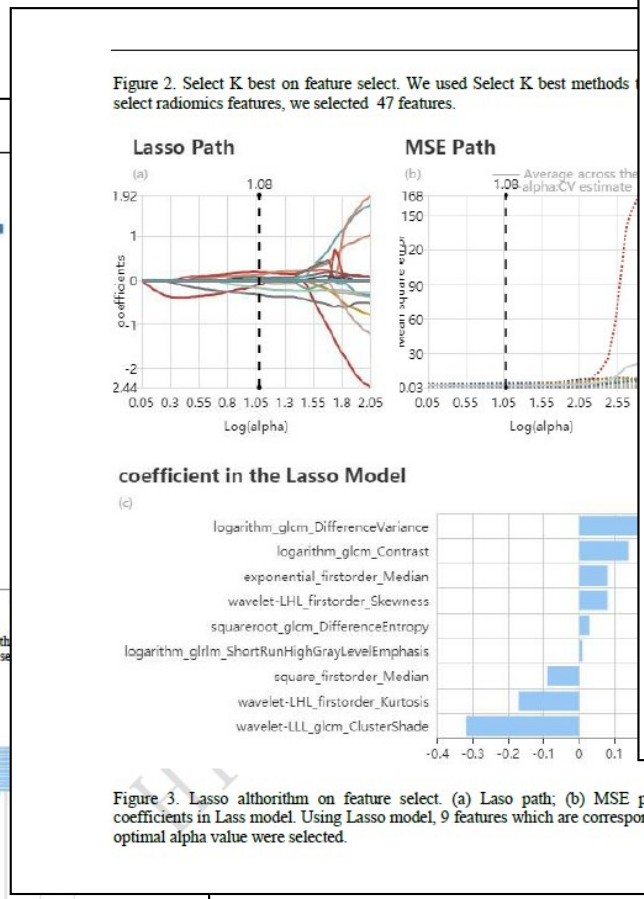

Figure 2. Select K best on feature select. We used Select K best methods
select radiomics features, we selected 47 features.

Figure 3. Lasso althorithm on feature select. (a) Laso path; (b) MSE path; (c) coefficients in Lass model. Using Lasso model, 9 features which are correspond to the optimal alpha value were selected.

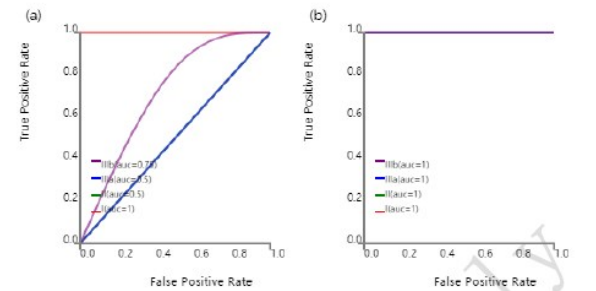

Figure 4. ROC curves of DT methods to classification. (a) ROC curve of training set, the AUC were 1.0 in I (sensitivity and specificity were 1.00 and 1.0), 1.0 in II (sensitivity and specificity were 1.00 and 1.0), 1.0 in IIIa (sensitivity and specificity were 1.00 and 1.0), 1.0 in IIIb (sensitivity and specificity were 1.00 and 1.0) respectively; (b) ROC curve of validation set, the AUC were 1.0 in I (sensitivity and specificity were 1.00 and 1.0), 0.5 in II (sensitivity and specificity were 0.00 and 1.0), 0.5 in IIIa (sensitivity and specificity were 0.00 and 1.0), 0.75 in IIIb (sensitivity and specificity were 1.00 and 0.0) respectively.

4.References

1. Lambin P, Rios-Velazquez E, Leijenaar R, et al. Radiomics: extracting more information from medical images using advanced feature analysis. European journal of cancer, 2012, 48(4): 441-446.

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4. Wang YY, Zhang T, Li SWet al. Mapping p53 mutations in low-grade glioma: a voxel-based neuroimaging analysis. AJNR Am J Neuroradiol, 2015, 36:70–76.

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