PathActMarker: an R package for inferring pathway activity of complex diseases

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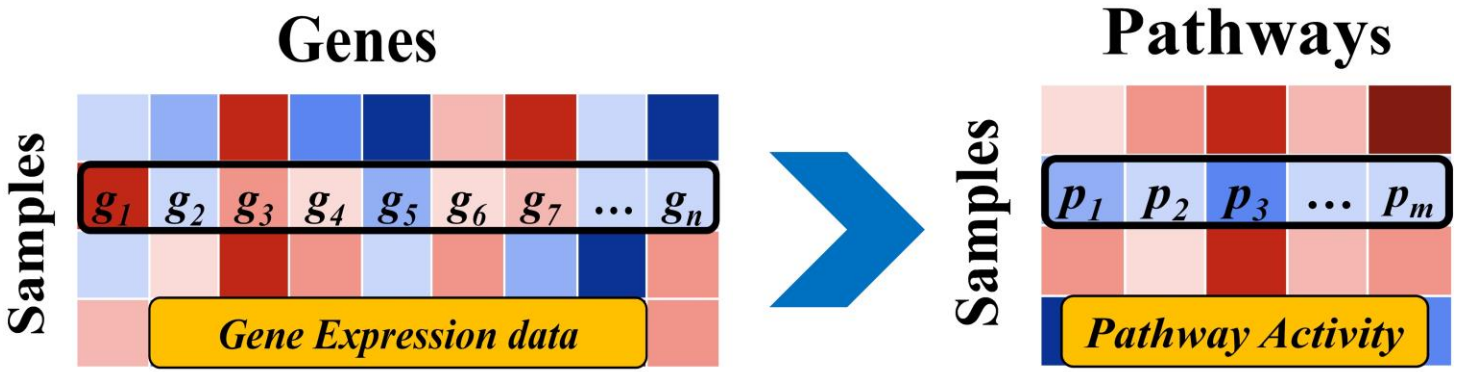
Problems & Ideas

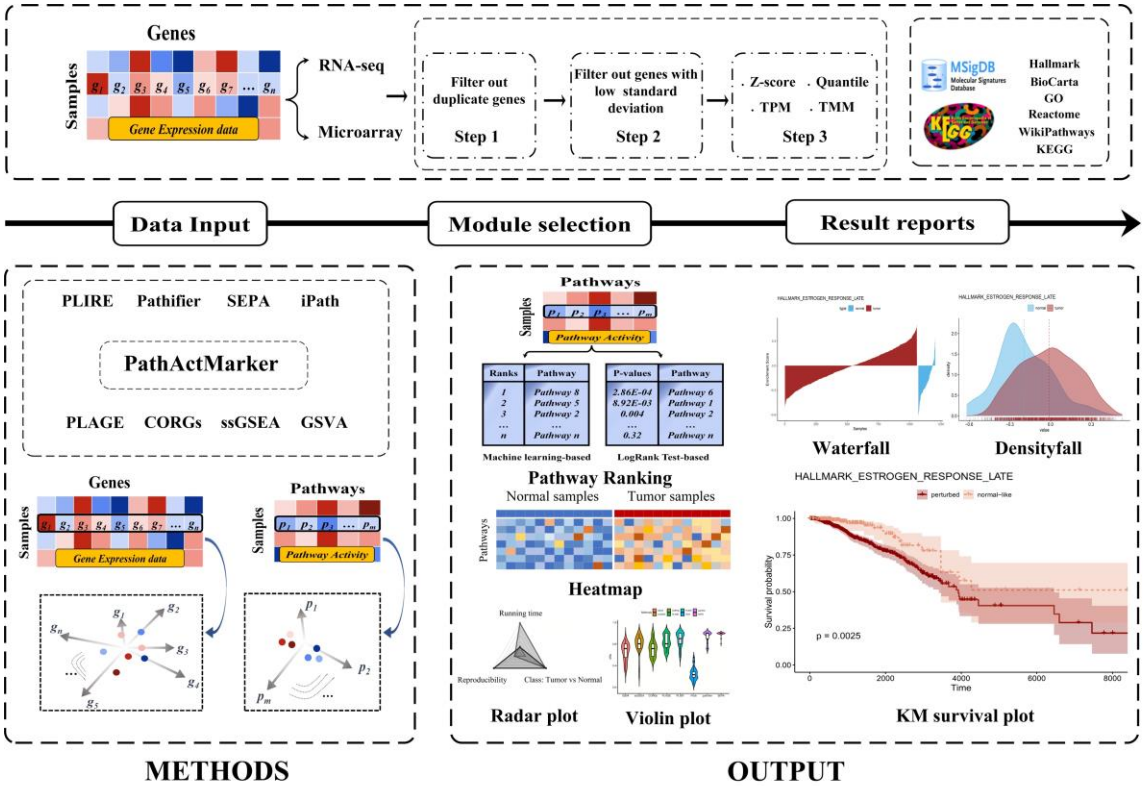
- Problems of complex diseases analysis:
  - The high-dimensional gene expression data is not conducive to complex disease analysis.
  - The process of complex diseases is closely related to the dysregulation of key biological pathways.
- Ideas: It's important to develop a powerful software package for pathway activity inference and analysis.



Converting high-dimensional gene expression data into a biologically interpretable low-dimensional pathway activity matrix

Main Contributions

- Contributions:
  - An R package for pathway activity inference and analysis which integrates representative methods.



i) Preprocessing of the input gene expression data and including six prevalent pathway sources; (ii) Eight state-of-the-art tools are provided to convert the high-dimensional gene expression data into biologically interpretable low-dimensional pathway activity matrics, and extensive evaluations are also included to measure the performance of these tools; (iii) Based on the pathway activity matrix, pathways can be ranked using statistical and machine learning algorithms and a set of functions are provided for interpretation and analysis of top-ranked pathways.