

Benjamin Wade¹, Victor Valcour², Lauren Wendelken-Riegelhaupt², Pardis Esmaili-Firidouni², Shantanu H. Joshi³, Yalin Wang⁴, Paul M. Thompson¹

¹Imaging Genetics Center, USC ²Memory and Aging Center, UCSF ³Ahmannson-Lovelace Brain Mapping Center, UCLA ⁴School of Computing, Informatics, and Decision Systems Engineering, ASU

Questions

- Are there discernible abnormalities in the subcortical morphometry of elderly people with HIV?
- Can the use of surface-based shape descriptors enhance classification of HIV+ brains beyond the use of volumetric measures?

Introduction

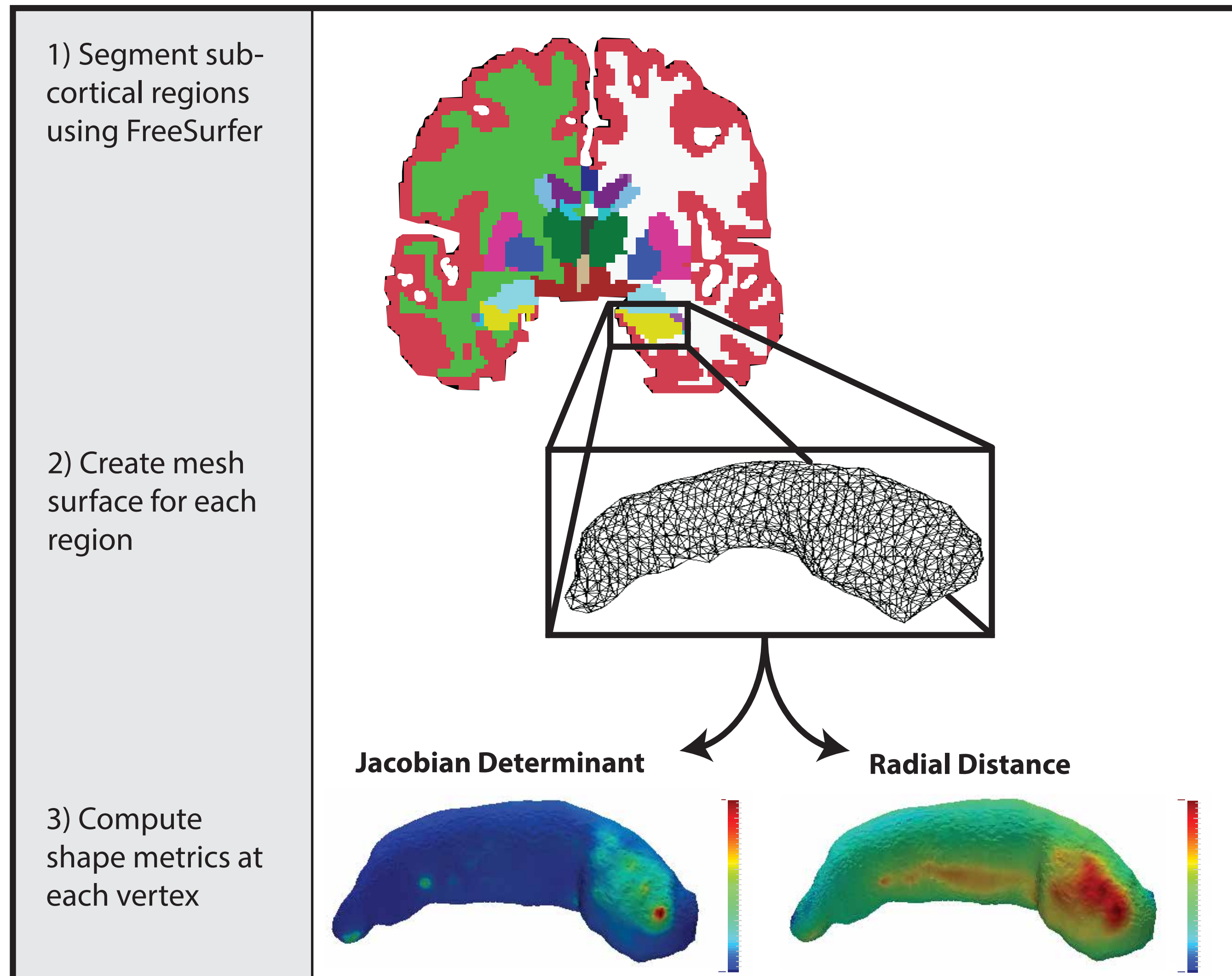
- Over 50% of HIV+ individuals show significant neurocognitive impairments.
- Basal ganglia, ventricular and white matter abnormalities are commonly reported in HIV+ cohorts.
- The extent of impairment is associated with subcortical structural atrophy.
- The profile of HIV-associated brain abnormalities remains poorly understood.
- Development of sensitive biomarkers for HIV-related atrophy would aid clinicians in determining which HIV patients will develop cognitive deficits.

Methods

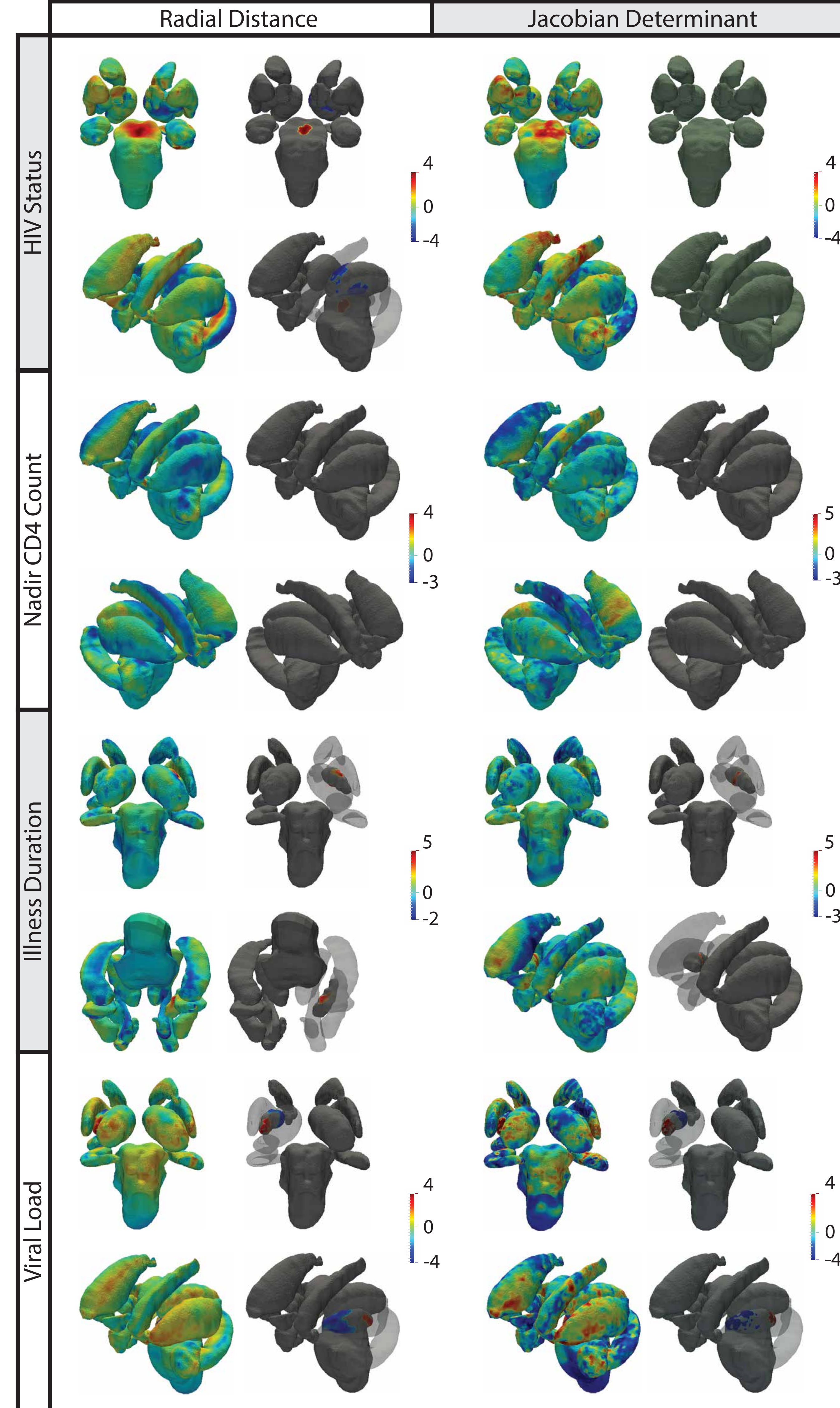
Subjects

- 63 elderly HIV+ subjects: 65.35 years old, 4 women
- 31 uninfected controls: 64.68 years old, 2 women

Morphometric descriptors

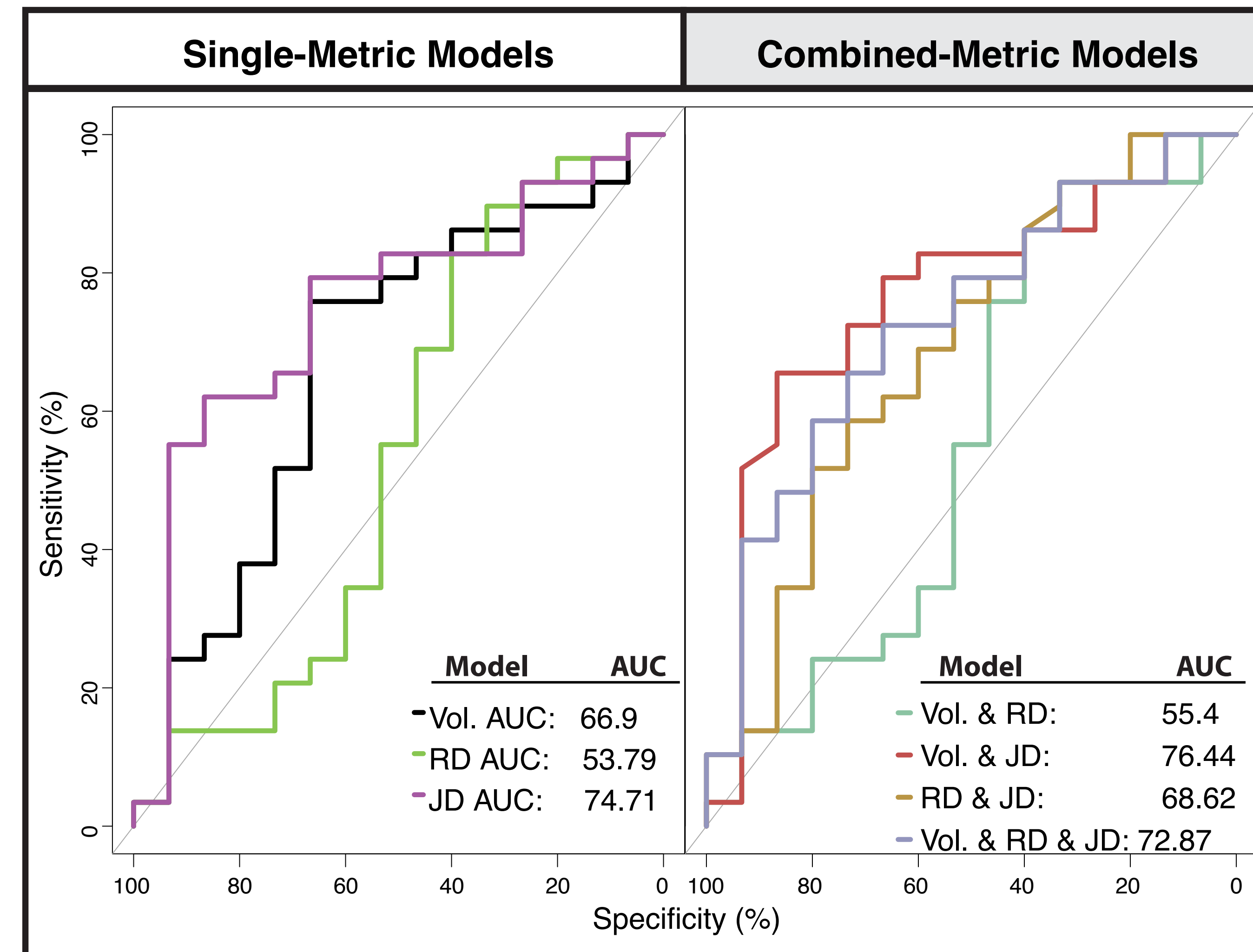


Shape-based differences



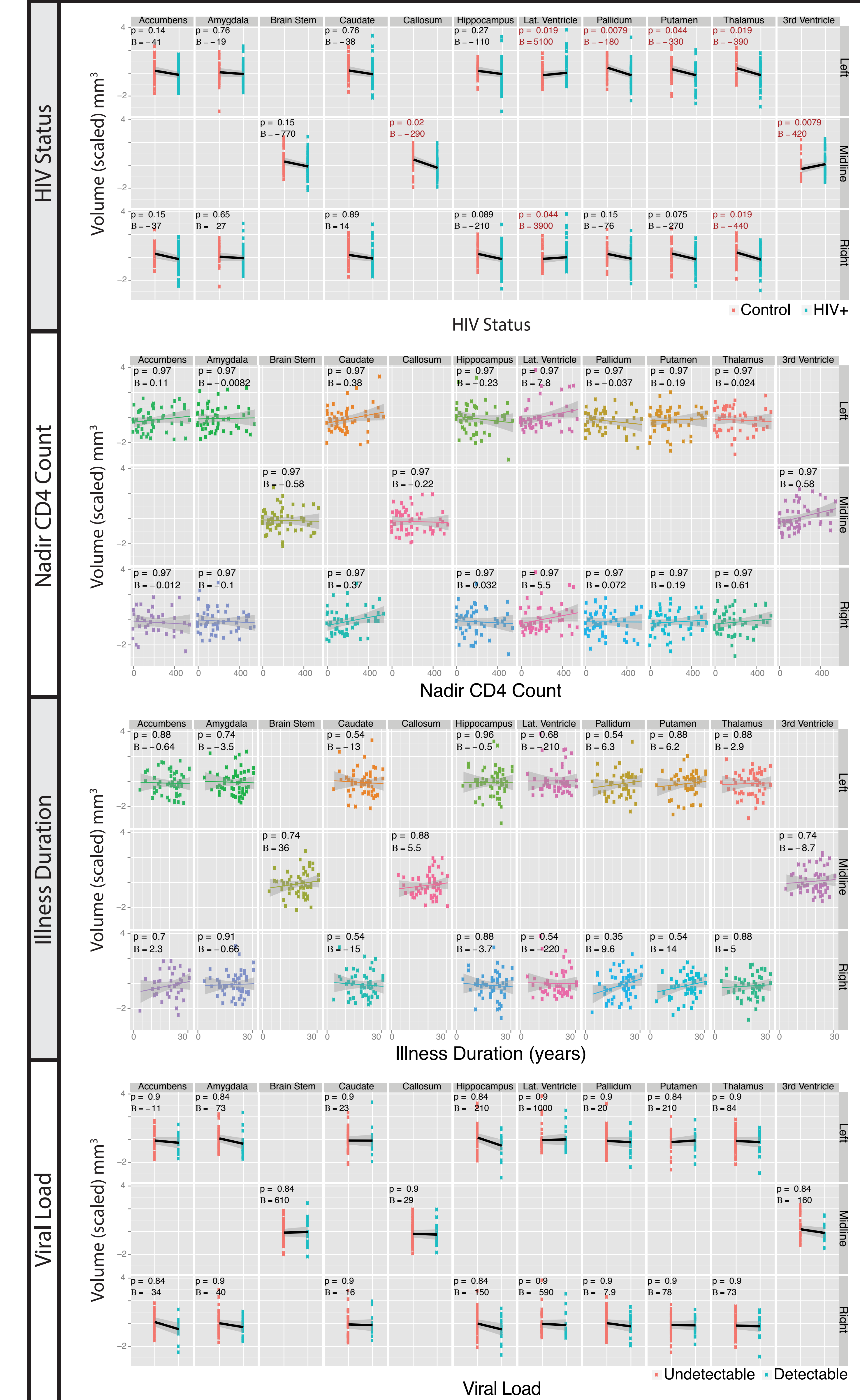
T-value maps of the subcortical surfaces modeling shape differences between HIV+ and control cohorts. First and third columns illustrate raw t-values from the main effect's coefficient. Second and fourth columns show thresholded surfaces in which regions not significantly different following FDR correction are depicted in black.

Classification performance by descriptor

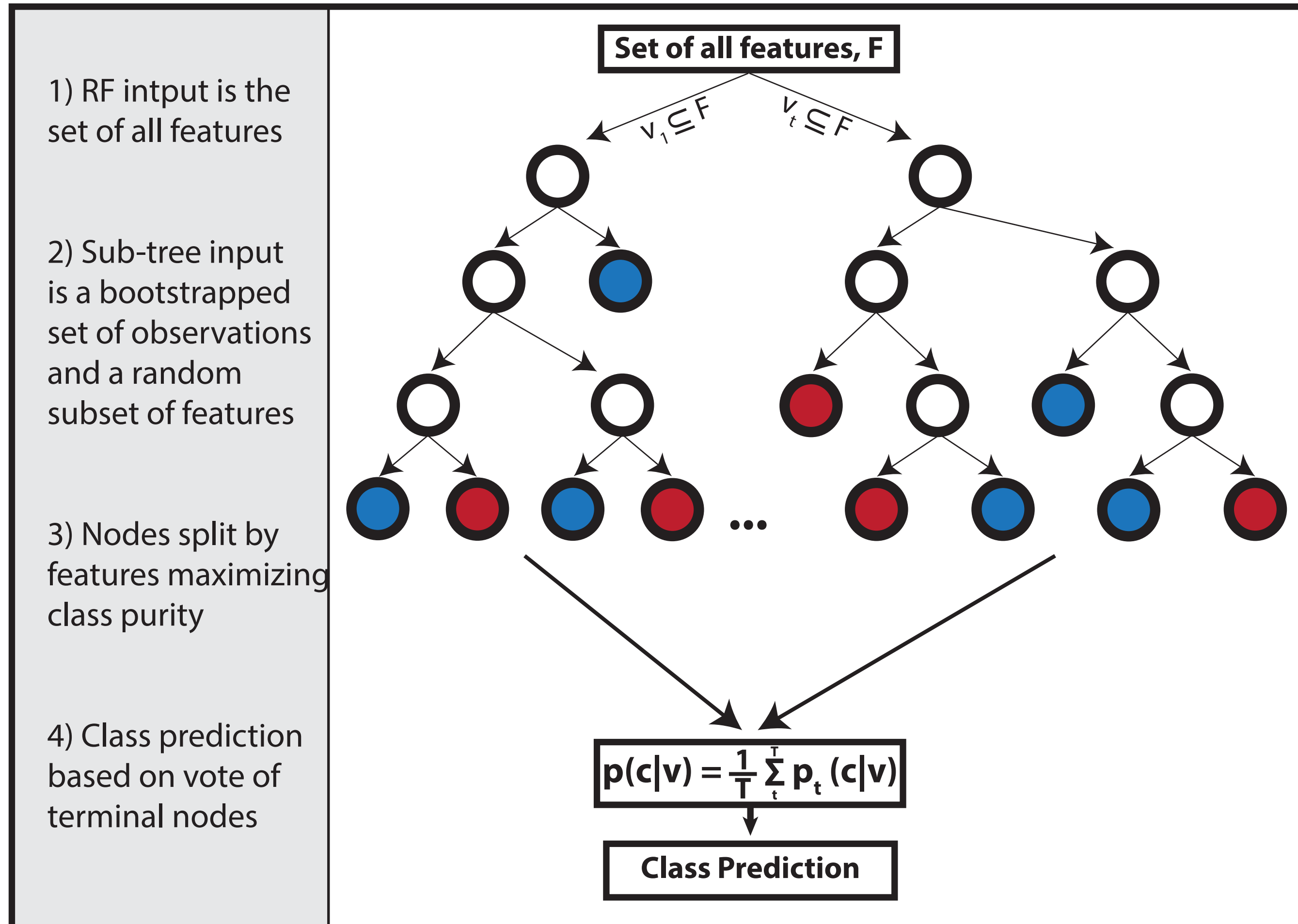


Results

Volumetric differences



Random Forest Classification



Conclusions

- Using volumetric and shape-based descriptors we were able to characterize abnormal subcortical morphometry in HIV.
- Correctly predicted that more extreme clinical measures were associated with more extreme subcortical atrophy.
- Observed unexpected enlargement of pallidi in relation to certain clinical measures.
- Volumetric and shape descriptors uniquely characterized separate aspects of the HIV+ phenotype.
- Classification was improved by shape descriptors in some cases.

References

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