Web-Based Diagnostic for Cognitive Impairment

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Breakfast Club
Why Should You Care?

✓ In 2006, there were over 37M people in the US age 65 or older

✓ 1.85M – 9.25M patients with Cognitive Impairment (CI, 5%-25% incidence rate)

✓ CI incidence rates vary by age and other factors

✓ 7-9 years of progression from CI to Alz

✓ Inconsistent Alz treatment initiation - current drugs only work in the early stage of CI

✓ Business Opportunity – Unmet need for standardized and repetitive monitoring of patients

✓ Enhance current and future therapeutic treatments for Alzheimer’s disease
How is CI Diagnosed?

• No single test is currently accepted for the diagnosis of CI – must rule out all other potential neurological diseases
  – Mental Status and Neuropsychological Assessments
  – Psychiatric Assessments
  – Blood Tests
  – Brain Imaging
  – Other Tests

• Visual comparison test are accepted method of memory testing
  – Used in patient and animal research
  – language independent

• Have been used to monitor CI at Emory
Monitoring CI Progression

• Stuart Zola – Director of Yerkes
  • Eye tracking can be used to identify memory deficits in monkeys and humans
  • Developed methods for visual paired comparison tests in CI patients
  • Can identify CI from Parkinson’s Disease patients
Monitoring User Intent on the Web

Eugene Agichtein – Math and Computer Science, Emory College

Can These Two Ideas be Combined?

Yes
Current Opportunity

• Web based testing system – 95% prediction accuracy

• How can this be used?
  – Educational tool
    • Sponsors
      – Alzheimer’s Association
      – Pharma companies
    • Advertising
  – Partnering with patient advocacy groups
    • Alzheimer’s Association
  – Web-based diagnostic
    • FDA regulatory approval
Demo

Demo - beta
Typical Results
Current Status

• Manuscript
  – Eye tracking for the diagnosis of MCI - Zola
  – Web behavior monitoring through mouse movement - Agichtein
  – Web based visual comparison testing – Zola and Agichtein

• Software
  – Beta version as demonstrated here today

• IP
  – US utility application pending on the user intent algorithms - Zola
  – PCT application that includes both eye tracking and mouse tracking for MCI diagnosis – Zola and Agichtein
Summary

✓ 37M patients (US 2006) with unmet need for standardized and repetitive monitoring for CI

✓ Enhance current and future therapeutic treatments for Alzheimer’s disease

✓ Followed CI progression in a cohort of older patients using eye tracking and visual paired comparison tests

✓ Working web-based CI prediction software

✓ IP filed for both the testing methods and algorithms