

Contents

| | |
|--|----|
| 1 Introduction | 1 |
| 1.1 The Problem | 1 |
| 1.2 PTSD and the Military..... | 2 |
| 1.3 Technology for PTSD..... | 3 |
| 1.4 Project Overview | 4 |
| 1.5 Book Outline..... | 5 |
| References | 6 |
| 2 Introduction to PTSD Signals | 7 |
| 2.1 Introduction | 7 |
| 2.2 Developing an Etymology of Terms for PTSD | 11 |
| References | 13 |
| 3 Data Sources | 15 |
| 3.1 Introduction | 15 |
| 3.1.1 Psychological Information Library (PIL) | 16 |
| 3.1.2 Brain Fitness Free Text Questions | 17 |
| 3.1.3 Social Media—Blogs and Forums | 18 |
| 4 Text Analytics | 21 |
| 4.1 Introduction | 21 |
| 4.2 Application to a Particular Field: Psychology/PTSD | 23 |
| 4.3 PTSD Data..... | 24 |
| 4.4 Procedures and Methods in Data Analysis..... | 25 |
| 4.5 Performance and Best Practices | 26 |
| 4.6 Human Annotation | 27 |
| 4.6.1 Likelihood of PTSD Syndrome | 28 |
| 4.6.2 Frequency/Intensity of Symptoms | 29 |
| 4.7 Human Annotation Results..... | 30 |
| References | 32 |

| | | |
|----------|---|----|
| 5 | Scoring Engine | 33 |
| 5.1 | Introduction | 33 |
| 5.2 | SentiGrade™ | 34 |
| 5.3 | SentiGrade™ Architecture | 34 |
| 5.3.1 | Architecture Diagram..... | 35 |
| 5.3.2 | Functional Architecture | 35 |
| 5.3.3 | Physical Architecture | 38 |
| 5.4 | SentiMetrix® API..... | 38 |
| 5.4.1 | Architecture..... | 39 |
| 5.4.2 | API Architecture Diagram | 39 |
| 5.4.3 | Opinion Expressing Constructs..... | 40 |
| 5.5 | Modifications Needed for the PTSD Domain..... | 42 |
| 5.5.1 | Ontology | 42 |
| 5.5.2 | TAPIR | 43 |
| | References | 49 |
| 6 | System Overview | 51 |
| 6.1 | Overall Architecture | 51 |
| 6.2 | SentiGrade™ Environment..... | 52 |
| 6.3 | SentiMetrix® API..... | 53 |
| 6.3.1 | API Technologies Used..... | 53 |
| 6.3.2 | Design | 54 |
| 6.3.3 | API Interfaces | 55 |
| 6.3.4 | Text Analysis Data Flow | 61 |
| 6.4 | Dashboard..... | 61 |
| 6.4.1 | Filters | 61 |
| 6.4.2 | Landing Page | 62 |
| 6.4.3 | Population Page | 63 |
| 6.4.4 | User Listing Page..... | 63 |
| 6.4.5 | User Detail Page | 65 |
| 6.4.6 | User Comparison Page..... | 65 |
| 7 | Conclusions | 67 |
| 7.1 | Data Set and Human Annotation..... | 68 |
| 7.2 | Suggested Evaluation Methodology | 70 |
| 7.3 | HA Validation Results | 71 |
| 7.4 | User Testing and Results | 72 |
| 7.4.1 | Brain Fitness Analysis Results..... | 74 |
| 7.4.2 | Text Analysis Results..... | 77 |
| 7.5 | Future Work | 78 |
| 7.5.1 | Testing and Analyses | 78 |
| 7.6 | Concluding Remarks | 81 |