**SUPPLEMENTAL TABLES**

**Table S1**. Number of cases based on consensus among ground truth makers.

|  |  |  |
| --- | --- | --- |
| Consensus among pathologists | Cases included based on consensus | Cases excluded based on consensus |
| n | % (out of n = 140) | n | % (out of n = 140) |
| 7 out of 7 ground truth makers (100.0%) | 57 | 40.7% | 83 | 59.3% |
| 6 out of 7 ground truth makers (85.7%) | 78 | 55.7% | 62 | 44.3% |
| 5 out of 7 ground truth makers (71.4%) | 87 | 62.1% | 53 | 37.9% |
| 4 out of 7 ground truth makers (57.1%) | 93 | 66.4% | 47 | 33.6% |
| 3 out of 7 ground truth makers (42.9%) | 102 | 72.9% | 38 | 27.1% |
| 2 out of 7 ground truth makers (28.6%) | 112 | 80.0% | 28 | 20.0% |

**Table S2.** Experience level of participants involved in the OPT component of the study.

|  |  |  |
| --- | --- | --- |
| Reviewer | Experience | AI support order |
| Facility 1, Reviewer A | PGY-2 | AI support second view |
| Facility 1, Reviewer B | PGY-3 | AI support second view |
| Facility 1, Reviewer C | PGY-4 | AI support second view |
| Facility 1, Reviewer D | Fellow | AI support second view |
| Facility 1, Reviewer E | Fellow | AI support second view |
| Facility 1, Reviewer F | Faculty | AI support second view |
| Facility 1, Reviewer G | PGY-2 | AI support first view |
| Facility 1, Reviewer H | PGY-3 | AI support first view |
| Facility 1, Reviewer I | PGY-4 | AI support first view |
| Facility 1, Reviewer J | Fellow | AI support first view |
| Facility 1, Reviewer K | Faculty | AI support first view |
| Facility 1, Reviewer L | Faculty | AI support first view |
| Facility 2, Reviewer A | PGY-2 | AI support second view |
| Facility 2, Reviewer B | PGY-3 | AI support second view |
| Facility 2, Reviewer C | PGY-4 | AI support second view |
| Facility 2, Reviewer D | Fellow | AI support second view |
| Facility 2, Reviewer E | Fellow | AI support second view |
| Facility 2, Reviewer F | Faculty | AI support second view |
| Facility 2, Reviewer G | PGY-2 | AI support first view |
| Facility 2, Reviewer H | PGY-3 | AI support first view |
| Facility 2, Reviewer I | PGY-4 | AI support first view |
| Facility 2, Reviewer J | Fellow | AI support first view |
| Facility 2, Reviewer K | Faculty | AI support first view |
| Facility 2, Reviewer L | Faculty | AI support first view |

PGY = postgraduate year; Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S3.** Individual accuracy reviewer results for the OPT.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reviewers | No AI Support | With AI Support | Improved Accuracy with AI support? | *X*2 (degrees of freedom) | p-value |
| Facility 1, Reviewer A | 49.4% | 57.5% | Yes | 6.97 (1) | **.008** |
| Facility 1, Reviewer B | 42.9% | 56.0% | Yes | 20.92 (1) | **<.001** |
| Facility 1, Reviewer C | 33.9% | 41.5% | Yes | 9.06 (1) | **.003** |
| Facility 1, Reviewer D | 63.2% | 59.1% | **No** | 1.59 (1) | .207 |
| Facility 1, Reviewer E | 58.4% | 59.8% | Yes | 0.19 (1) | .667 |
| Facility 1, Reviewer F | 51.6% | 51.6% | Yes | 0 (1) | .998 |
| Facility 1, Reviewer G | 46.5% | 57.9% | Yes | 12.80 (1) | **<.001** |
| Facility 1, Reviewer H | 52.8% | 64.5% | Yes | 11.87 (1) | **.001** |
| Facility 1, Reviewer I | 50.6% | 59.3% | Yes | 6.79 (1) | **.009** |
| Facility 1, Reviewer J | 45.1% | 49.3% | Yes | 2.12 (1) | .146 |
| Facility 1, Reviewer K | 43.0% | 57.6% | Yes | 24.29 (1) | **<.001** |
| Facility 1, Reviewer L | 45.6% | 61.3% | Yes | 24.34 (1) | **<.001** |
| Facility 2, Reviewer A | 20.6% | 42.8% | Yes | 61.56 (1) | **<.001** |
| Facility 2, Reviewer B | 52.0% | 61.8% | Yes | 10.75 (1) | **.001** |
| Facility 2, Reviewer C | 39.5% | 54.9% | Yes | 22.20 (1) | **<.001** |
| Facility 2, Reviewer D | 46.0% | 60.7% | Yes | 21.24 (1) | **<.001** |
| Facility 2, Reviewer E | 47.3% | 55.8% | Yes | 7.16 (1) | **.007** |
| Facility 2, Reviewer F | 30.5% | 46.7% | Yes | 36.71 (1) | **<.001** |
| Facility 2, Reviewer G | 32.2% | 47.4% | Yes | 20.83 (1) | **<.001** |
| Facility 2, Reviewer H | 45.4% | 53.1% | Yes | 7.50 (1) | **.006** |
| Facility 2, Reviewer I | 35.2% | 61.8% | Yes | 61.70 (1) | **<.001** |
| Facility 2, Reviewer J | 39.7% | 61.4% | Yes | 39.70 (1) | **<.001** |
| Facility 2, Reviewer K | 44.0% | 56.1% | Yes | 12.63 (1) | **<.001** |
| Facility 2, Reviewer L | 51.6% | 59.4% | Yes | 5.96 (1) | **.015** |

Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S4.** Individual reviewer TP, FP, FN mitotic cell detection results for the OPT.

|  |  |  |
| --- | --- | --- |
| Reviewer | No AI support | AI support |
| **TP** | **FP** | **FN** | **TP** | **FP** | **FN** |
| Facility 1, Reviewer A | 250 | 124 | 132 | 318 | 171 | 64 |
| Facility 1, Reviewer B | 312 | 345 | 70 | 293 | 141 | 89 |
| Facility 1, Reviewer C | 276 | 431 | 106 | 291 | 320 | 91 |
| Facility 1, Reviewer D | 331 | 142 | 51 | 246 | 34 | 136 |
| Facility 1, Reviewer E | 277 | 92 | 105 | 296 | 113 | 86 |
| Facility 1, Reviewer F | 231 | 66 | 151 | 230 | 64 | 152 |
| Facility 1, Reviewer G | 242 | 138 | 140 | 270 | 84 | 112 |
| Facility 1, Reviewer H | 214 | 23 | 168 | 282 | 55 | 100 |
| Facility 1, Reviewer I | 208 | 29 | 174 | 283 | 95 | 99 |
| Facility 1, Reviewer J | 261 | 197 | 121 | 306 | 239 | 76 |
| Facility 1, Reviewer K | 277 | 262 | 105 | 296 | 132 | 86 |
| Facility 1, Reviewer L | 246 | 157 | 136 | 279 | 73 | 103 |
| Facility 2, Reviewer A | 121 | 206 | 261 | 207 | 102 | 175 |
| Facility 2, Reviewer B | 301 | 197 | 81 | 319 | 134 | 63 |
| Facility 2, Reviewer C | 161 | 26 | 221 | 297 | 159 | 85 |
| Facility 2, Reviewer D | 248 | 157 | 134 | 276 | 73 | 106 |
| Facility 2, Reviewer E | 241 | 127 | 141 | 274 | 109 | 108 |
| Facility 2, Reviewer F | 224 | 352 | 158 | 278 | 213 | 104 |
| Facility 2, Reviewer G | 136 | 41 | 246 | 208 | 57 | 174 |
| Facility 2, Reviewer H | 308 | 296 | 74 | 314 | 209 | 68 |
| Facility 2, Reviewer I | 148 | 39 | 234 | 278 | 68 | 104 |
| Facility 2, Reviewer J | 166 | 36 | 216 | 261 | 43 | 121 |
| Facility 2, Reviewer K | 180 | 27 | 202 | 258 | 78 | 124 |
| Facility 2, Reviewer L | 237 | 77 | 145 | 306 | 133 | 76 |

Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S5.** Sensitivity results by experience level and individual reviewer for the OPT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | No AI Support | AI Support | Improved Sensitivity with AI support? |
| Experience level | PGY-2 | 49.0% | 65.6% | Yes |
| PGY-3 | 74.3% | 79.1% | Yes |
| PGY-4 | 51.9% | 75.2% | Yes |
| Fellow | 66.5% | 72.4% | Yes |
| Faculty | 60.9% | 71.9% | Yes |
| Reviewer | Facility 1, Reviewer A | 65.4% | 83.2% | Yes |
| Facility 1, Reviewer B | 81.7% | 76.7% | No |
| Facility 1, Reviewer C | 72.3% | 76.2% | Yes |
| Facility 1, Reviewer D | 86.6% | 64.4% | No |
| Facility 1, Reviewer E | 72.5% | 77.5% | Yes |
| Facility 1, Reviewer F | 60.5% | 60.2% | No |
| Facility 1, Reviewer G | 63.4% | 70.7% | Yes |
| Facility 1, Reviewer H | 56.0% | 73.8% | Yes |
| Facility 1, Reviewer I | 54.5% | 74.1% | Yes |
| Facility 1, Reviewer J | 68.3% | 80.1% | Yes |
| Facility 1, Reviewer K | 72.5% | 77.5% | Yes |
| Facility 1, Reviewer L | 64.4% | 73.0% | Yes |
| Facility 2, Reviewer A | 31.7% | 54.2% | Yes |
| Facility 2, Reviewer B | 78.8% | 83.5% | Yes |
| Facility 2, Reviewer C | 42.1% | 77.7% | Yes |
| Facility 2, Reviewer D | 64.9% | 72.3% | Yes |
| Facility 2, Reviewer E | 63.1% | 71.7% | Yes |
| Facility 2, Reviewer F | 58.6% | 72.8% | Yes |
| Facility 2, Reviewer G | 35.6% | 54.5% | Yes |
| Facility 2, Reviewer H | 80.6% | 82.2% | Yes |
| Facility 2, Reviewer I | 38.7% | 72.8% | Yes |
| Facility 2, Reviewer J | 43.5% | 68.3% | Yes |
| Facility 2, Reviewer K | 47.1% | 67.5% | Yes |
| Facility 2, Reviewer L | 62.0% | 80.1% | Yes |
| **Overall** | **61.0%** | **72.7%** | **Yes** |

PGY = postgraduate year; Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S6.** Precision results by experience level and individual reviewer for the OPT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | No AI Support | AI Support | Improved Precision with AI support? |
| Experience level | PGY-2 | 59.5% | 70.8% | Yes |
| PGY-3 | 56.9% | 69.1% | Yes |
| PGY-4 | 60.2% | 64.2% | Yes |
| Fellow | 67.0% | 73.1% | Yes |
| Faculty | 59.7% | 70.4% | Yes |
| Reviewer | Facility 1, Reviewer A | 66.8% | 65.0% | No |
| Facility 1, Reviewer B | 47.5% | 67.5% | Yes |
| Facility 1, Reviewer C | 39.0% | 47.6% | Yes |
| Facility 1, Reviewer D | 70.0% | 87.9% | Yes |
| Facility 1, Reviewer E | 75.1% | 72.4% | No |
| Facility 1, Reviewer F | 77.8% | 78.2% | Yes |
| Facility 1, Reviewer G | 63.7% | 76.3% | Yes |
| Facility 1, Reviewer H | 90.3% | 83.7% | No |
| Facility 1, Reviewer I | 87.8% | 74.9% | No |
| Facility 1, Reviewer J | 57.0% | 56.1% | No |
| Facility 1, Reviewer K | 51.4% | 69.2% | Yes |
| Facility 1, Reviewer L | 61.0% | 79.3% | Yes |
| Facility 2, Reviewer A | 37.0% | 67.0% | Yes |
| Facility 2, Reviewer B | 60.4% | 70.4% | Yes |
| Facility 2, Reviewer C | 86.1% | 65.1% | No |
| Facility 2, Reviewer D | 61.2% | 79.1% | Yes |
| Facility 2, Reviewer E | 65.5% | 71.5% | Yes |
| Facility 2, Reviewer F | 38.9% | 56.6% | Yes |
| Facility 2, Reviewer G | 76.8% | 78.5% | Yes |
| Facility 2, Reviewer H | 51.0% | 60.0% | Yes |
| Facility 2, Reviewer I | 79.1% | 80.3% | Yes |
| Facility 2, Reviewer J | 82.2% | 85.9% | Yes |
| Facility 2, Reviewer K | 87.0% | 76.8% | No |
| Facility 2, Reviewer L | 75.5% | 69.7% | No |
| **Overall** | **60.9%** | **69.7%** | **Yes** |

PGY = postgraduate year; Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S7.** F-scores by experience level and individual reviewer for the OPT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | No AI Support | AI Support | Improved f-score with AI support? |
| Experience level | PGY-2 | 0.54 | 0.68 | Yes |
| PGY-3 | 0.64 | 0.74 | Yes |
| PGY-4 | 0.56 | 0.69 | Yes |
| Fellow | 0.67 | 0.73 | Yes |
| Faculty | 0.60 | 0.71 | Yes |
| Reviewer | Facility 1, Reviewer A | 0.66 | 0.73 | Yes |
| Facility 1, Reviewer B | 0.60 | 0.72 | Yes |
| Facility 1, Reviewer C | 0.51 | 0.59 | Yes |
| Facility 1, Reviewer D | 0.77 | 0.74 | No |
| Facility 1, Reviewer E | 0.74 | 0.75 | Yes |
| Facility 1, Reviewer F | 0.68 | 0.68 | Yes |
| Facility 1, Reviewer G | 0.64 | 0.73 | Yes |
| Facility 1, Reviewer H | 0.69 | 0.78 | Yes |
| Facility 1, Reviewer I | 0.67 | 0.74 | Yes |
| Facility 1, Reviewer J | 0.62 | 0.66 | Yes |
| Facility 1, Reviewer K | 0.60 | 0.73 | Yes |
| Facility 1, Reviewer L | 0.63 | 0.76 | Yes |
| Facility 2, Reviewer A | 0.34 | 0.60 | Yes |
| Facility 2, Reviewer B | 0.68 | 0.76 | Yes |
| Facility 2, Reviewer C | 0.57 | 0.71 | Yes |
| Facility 2, Reviewer D | 0.63 | 0.76 | Yes |
| Facility 2, Reviewer E | 0.64 | 0.72 | Yes |
| Facility 2, Reviewer F | 0.47 | 0.64 | Yes |
| Facility 2, Reviewer G | 0.49 | 0.64 | Yes |
| Facility 2, Reviewer H | 0.62 | 0.69 | Yes |
| Facility 2, Reviewer I | 0.52 | 0.76 | Yes |
| Facility 2, Reviewer J | 0.57 | 0.76 | Yes |
| Facility 2, Reviewer K | 0.61 | 0.72 | Yes |
| Facility 2, Reviewer L | 0.68 | 0.75 | Yes |
| **Overall** | **0.61** | **0.71** | **Yes** |

PGY = postgraduate year; Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center

**Table S8.** Individual reviewer results for time spent during the OPT.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reviewer | Median # of seconds | AI or no AI faster? | Z | p-value | r |
| **No AI support** | **AI support** |
| Facility 1, Reviewer A | 27.00 | 24.00 | AI | -0.300 | .764 | .03 |
| Facility 1, Reviewer B | 44.00 | 28.00 | AI | -6.323 | **<.001** | .53 |
| Facility 1, Reviewer C | 52.00 | 47.00 | AI | -0.962 | .336 | .08 |
| Facility 1, Reviewer D | 69.00 | 14.50 | AI | -9.978 | **<.001** | .84 |
| Facility 1, Reviewer E | 22.00 | 15.00 | AI | -6.156 | **<.001** | .52 |
| Facility 1, Reviewer F | 26.00 | 21.00 | AI | -1.714 | .087 | .14 |
| Facility 1, Reviewer G | 42.00 | 38.00 | AI | -1.395 | .163 | .12 |
| Facility 1, Reviewer H | 9.00 | 12.00 | No AI | -4.525 | **<.001** | .38 |
| Facility 1, Reviewer I | 17.50 | 16.00 | AI | -0.124 | .901 | .01 |
| Facility 1, Reviewer J | 37.00 | 45.00 | No AI | -5.576 | **<.001** | .47 |
| Facility 1, Reviewer K | 35.00 | 38.50 | No AI | -1.748 | .080 | .15 |
| Facility 1, Reviewer L | 30.50 | 28.50 | AI | -0.820 | .412 | .07 |
| Facility 2, Reviewer A | 51.00 | 31.50 | AI | -7.046 | **<.001** | .60 |
| Facility 2, Reviewer B | 43.00 | 38.00 | AI | -0.486 | .627 | .04 |
| Facility 2, Reviewer C | 25.00 | 50.00 | No AI | -5.747 | **<.001** | .49 |
| Facility 2, Reviewer D | 64.50 | 12.00 | AI | -10.226 | **<.001** | .86 |
| Facility 2, Reviewer E | 37.00 | 7.00 | AI | -10.004 | **<.001** | .85 |
| Facility 2, Reviewer F | 41.00 | 43.00 | No AI | -0.098 | .922 | .01 |
| Facility 2, Reviewer G | 36.00 | 17.00 | AI | -7.912 | **<.001** | .67 |
| Facility 2, Reviewer H | 76.00 | 53.00 | AI | -1.299 | .194 | .11 |
| Facility 2, Reviewer I | 12.00 | 8.50 | AI | -1.658 | .097 | .14 |
| Facility 2, Reviewer J | 54.50 | 32.00 | AI | -4.269 | **<.001** | .36 |
| Facility 2, Reviewer K | 30.00 | 25.00 | AI | -2.650 | **.008** | .22 |
| Facility 2, Reviewer L | 36.50 | 27.50 | AI | -3.592 | **<.001** | .30 |

r = effect size; Facility 1 = Samsung Medical Center, Facility 2 = University of Pittsburgh Medical Center