Assessment of inflammation in patients with rheumatoid arthritis using thermography and machine learning: a fast and automated technique.

Supplementary

**Supplementary table S1:** Main specifications of the thermal cameras used in this study.

|                          | FLIR ONE PRO                  | THERMAL EXPERT TE-Q1            |
|--------------------------|-------------------------------|---------------------------------|
| **Wavelength band**      | 8 to 14 µm                    | 8 to 14 µm                      |
| **Detector type**        | Uncooled microbolometer       | Uncooled microbolometer         |
| **Thermal resolution**   | 160x120 pixels                | 384x288 pixels                  |
| **Thermal sensitivity**  | 70 mk                         | < 50 mk                         |
| **Scene temperature range** | -20°C to 400°C               | -10°C to 150°C                  |
| **Non-uniformity correction (NUC)** | Integrated with shutter            | Manual using lens cap            |
| **Focus**                | Fixed 15 cm — Infinity        | Adjustable from 20 cm to infinite (6.8 mm lens) |
| **Manufacturer**         | Teledyne FLIR LLC (Wilsonville, OR, USA) | i3system, Inc. (Daejeon, Republic of Korea) |
**Supplementary table S2:** Analysis of the area under the receiver operating curve (AUROC) of the Thermographic Joint Inflammation Score (ThermoJIS) for the detection of active synovitis in different age and gender groups.

|                  | n  | AUROC                      |
|------------------|----|---------------------------|
| **Age (years) ≤ 45** | 30 | 0.78 (95% CI, 0.61 to 0.96; p<0.01) |
| **Age (years) > 45 and ≤ 55** | 39 | 0.81 (95% CI, 0.67 to 0.95; p<0.01) |
| **Age (years) > 55 and ≤ 65** | 39 | 0.73 (95% CI, 0.56 to 0.90; p<0.05) |
| **Age (years) > 65** | 38 | 0.81 (95% CI, 0.63 to 1.00; p<0.01) |
| **Male**         | 29 | 0.83 (95% CI, 0.67 to 0.99; p<0.01) |
| **Female**       | 117 | 0.77 (95% CI, 0.68 to 0.85; p<0.01) |
Supplementary figure S1: Diagram of the participants of the study.

RA, rheumatoid arthritis; PsA, psoriatic arthritis; UA, undifferentiated arthritis; SA, arthritis of hands secondary to other diseases; OA, osteoarthritis; HS, healthy subjects;
Supplementary figure S2: Distribution of ThermoJIS values from the validation set.
**Supplementary figure S3:** Analysis of the precision-recall curve (PRC) of the ThermoJIS score for the detection of active synovitis. a) Considering the entire validation set (Average Precision, 0.79; Baseline Precision, 0.53); b) Considering the ThermoJIS values lower than 3.46 and greater than 5.65 of the validation set (Average Precision, 0.86; Baseline Precision, 0.47). The baseline precision (dotted line) is the proportion of positives in the set, i.e., the random precision.