Extracting field boundaries from satellite imagery with a convolutional neural network to enable smart farming at scale

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The number of digital agricultural services providing field-level information to farmers is sky-rocketing. Field boundaries need to be drawn manually by growers upon subscription. Using deep learning, We seek to automatically extract field boundaries from satellite images and as a result facilitate onboarding of growers.

Our method showed good performance in a test site in South Africa [2].

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<tbody>
<tr>
<td>Overall accuracy</td>
<td>91%</td>
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<tr>
<td>Undersegmentation rate</td>
<td>83%</td>
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<tr>
<td>Oversegmentation rate</td>
<td>90%</td>
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Our convolutional neural network learns complex hierarchical contextual image features to accurately detect field boundaries.

Without retraining, our method also generalised well across sensors (Sentinel-2, Landsat-8), resolutions (10 m, 30 m), space and time [2].

Given this generalisation ability, we are applying our method to Sentinel-2 data in Australia.

By minimising over-fitting and image preprocessing, our method facilitates the extraction of individual crop fields at scale.

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