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| **ForestInsights: Mapping New Zealand’s forests through deep learning and data-centric AI** |
| The effective management of New Zealand’s existing and future forests relies on detailed information of their extent, location, and characteristics. However, fine-level information describing planted forest location and extent is currently lacking at a national level and is often only available for large scale plantation estates, overlooking the significant contribution of woodlots and shelterbelts, and the potential for large-scale afforestation by small growers.  Leveraging powerful advancements in AI technology and freely available imagery and LiDAR data that is routinely captured by regional councils, Scion’s ForestInsights project aims to establish a comprehensive depiction of the whole of New Zealand’s planted forest estate.  A high-resolution map of New Zealand’s radiata pine forests and woodlots was produced using a deep learning AI model developed for use with RGB aerial imagery. The model was trained on a large dataset of hand-labelled aerial imagery ranging from 15 – 30 cm spatial resolution with a wide variety of visual characteristics, enabling the model to be highly generalisable across imagery captured under a broad range of conditions. Once mapped, forests can be characterised using airborne LiDAR data, from which important metrics such as tree height, stocking, volume, and biodiversity (e.g., forest structure) can be accurately derived.  Work is currently underway to incorporate other planted forest species and to extend the approach across the whole of New Zealand as the national LiDAR acquisition programme progresses. The establishment of this baseline represents foundational work that will enables us to better describe where our forests are, what they contain in terms of timber, and drive greater understanding of this critical resource at a national scale. |