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The Future of Artificial Intelligence for Agribusiness

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NYU Stern School of Business



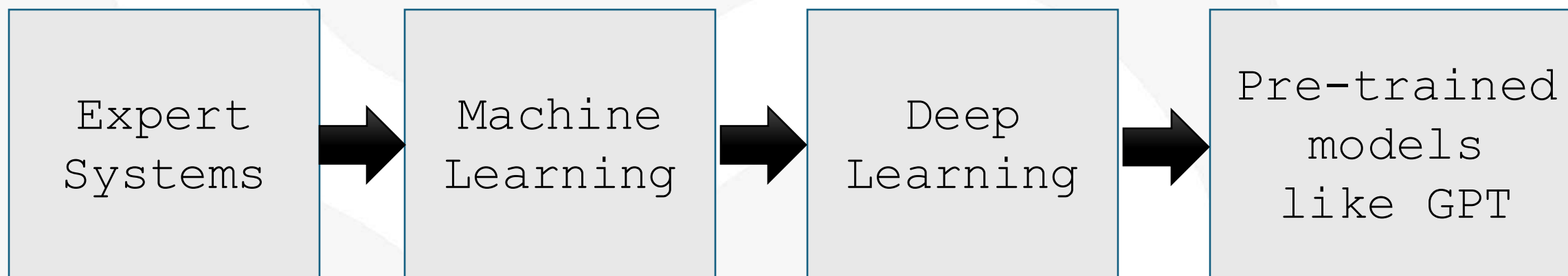
Pre-AI: computers told exactly what to do

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```
$SESSION['_CAPTCHA']['config'] = serialize($captcha_config);  
return array(  
    'code' => $captcha_config['code'],  
    'image_src' => $image_src  
);  
  
if ( !function_exists('hex2rgb') ) {  
    function hex2rgb($hex_str, $return_string = false, $separator = ',') {  
        $hex_str = preg_replace("/^[^0-9A-Fa-f]/", '', $hex_str); // Gets a proper hex string  
        if ( strlen($hex_str) == 6 ) {  
            $color_val = hexdec($hex_str);  
            $rgb_array['r'] = 0xFF & ($color_val >> 0x10);  
            $rgb_array['g'] = 0xFF & ($color_val >> 0x08);  
            $rgb_array['b'] = 0xFF & $color_val;  
        } elseif ( strlen($hex_str) == 3 ) {  
            $rgb_array['r'] = hexdec(str_repeat(substr($hex_str, 0, 1), 2));  
            $rgb_array['g'] = hexdec(str_repeat(substr($hex_str, 1, 1), 2));  
            $rgb_array['b'] = hexdec(str_repeat(substr($hex_str, 2, 1), 2));  
        } else {  
            return false;  
        }  
        return $return_string ? implode($separator, $rgb_array) : $rgb_array;  
    }  
}
```

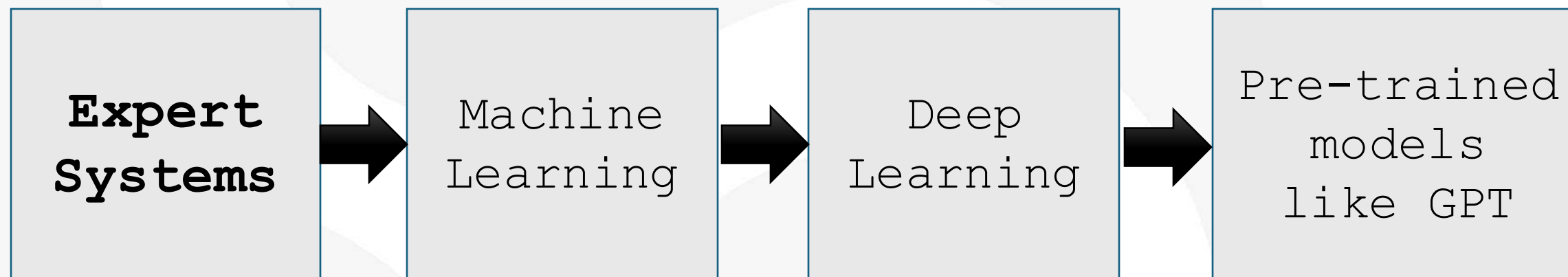


The many phases of AI





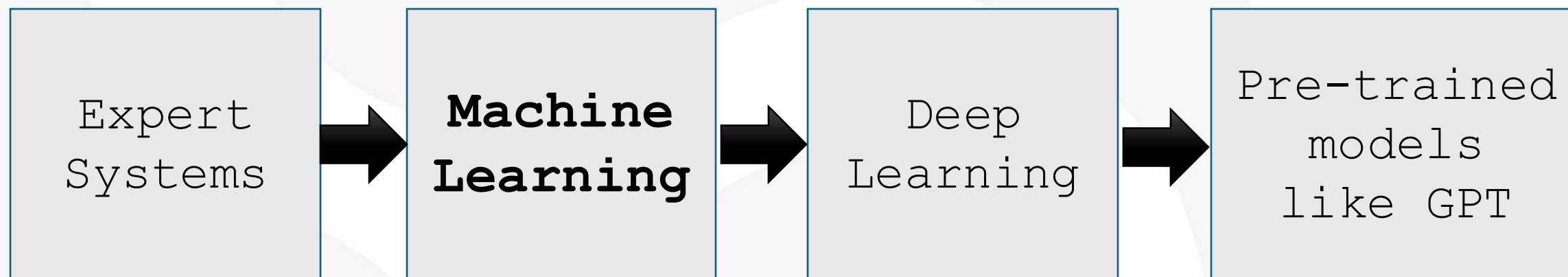
Expert systems: aggregate expert rules



expert-derived (heuristic) rule-based



machine learning: learn directly from data



Examples: logistic regression, SVM, decision trees, random forests

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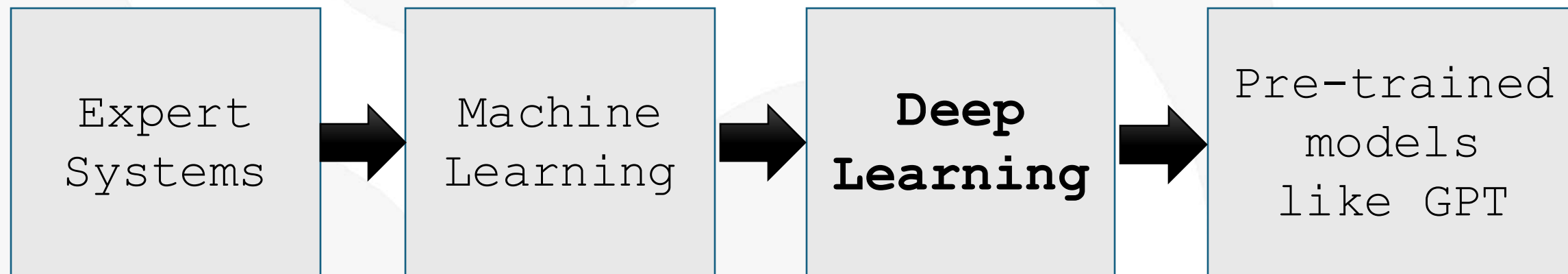


@teenybiscuit



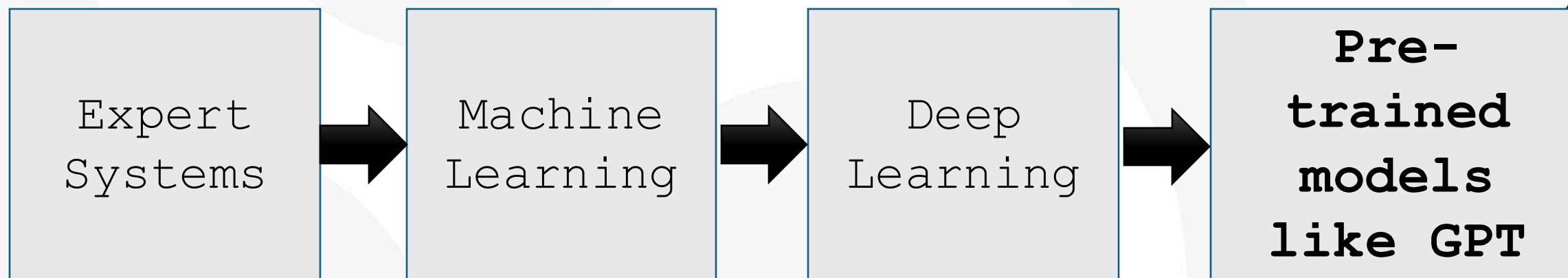


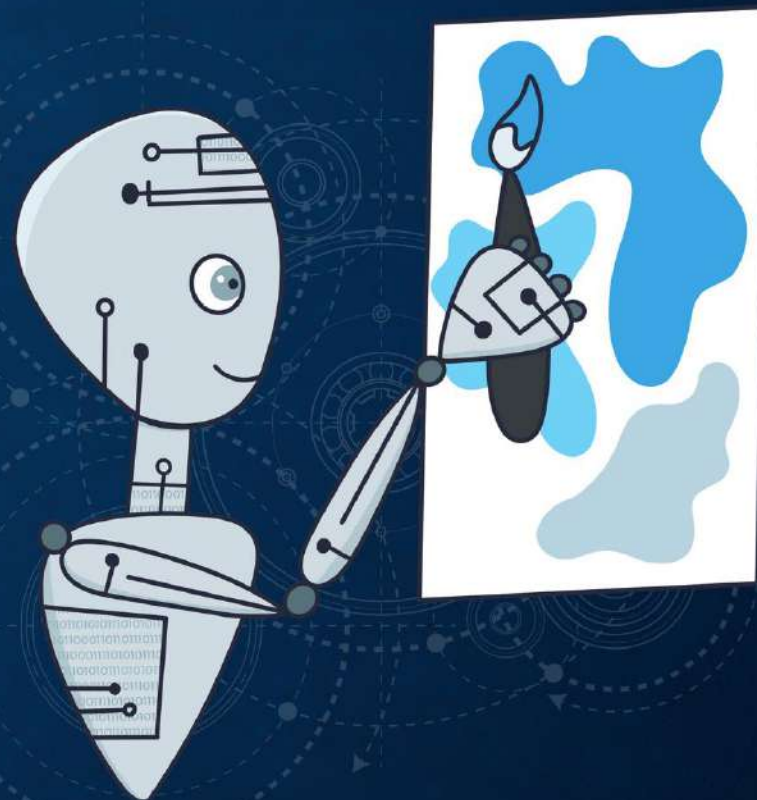
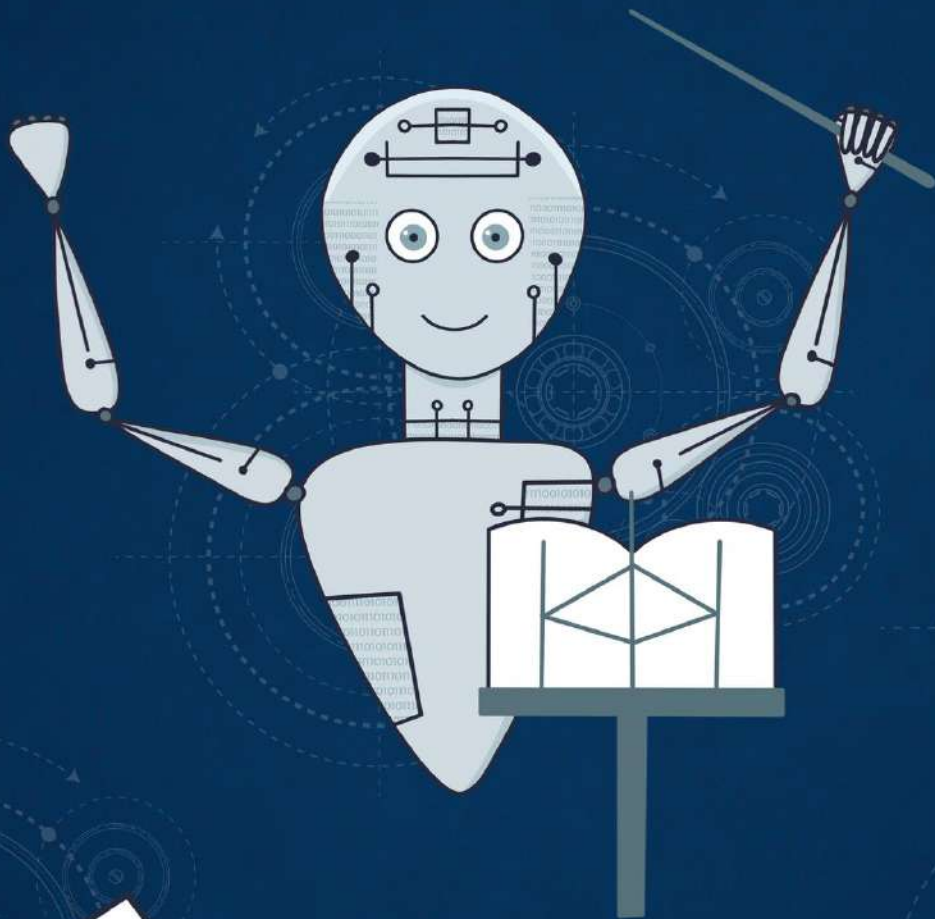
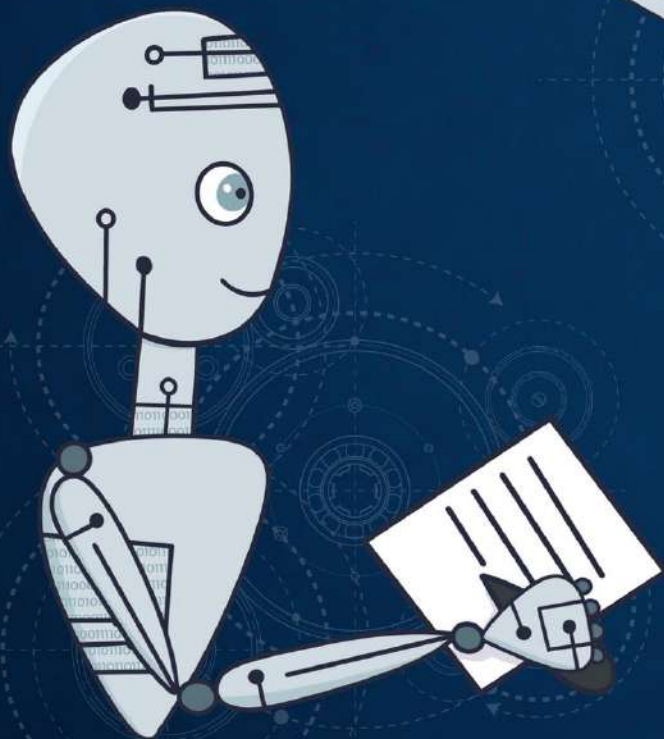
deep learning: AI creates own features





AI today: generative AI and platforms

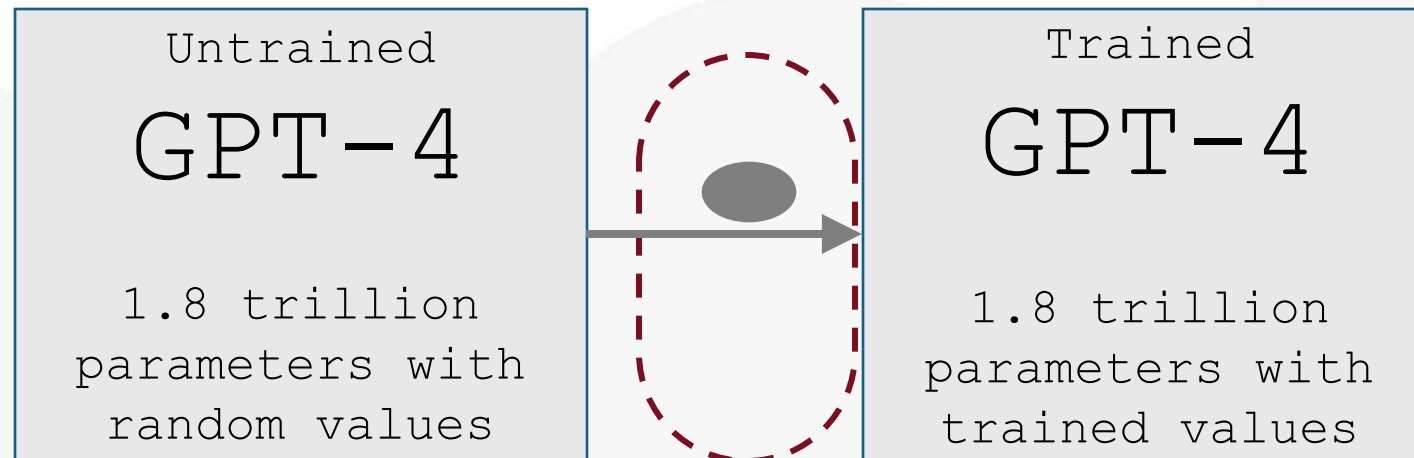




genAI and LLMs

- ❑ Simple idea: Massive **deep neural networks** trained on vast amounts of text
- ❑ Trained to predict the next word, given a “context” and “prompt”
- ❑ Example: GPT

1 petabyte of
training data

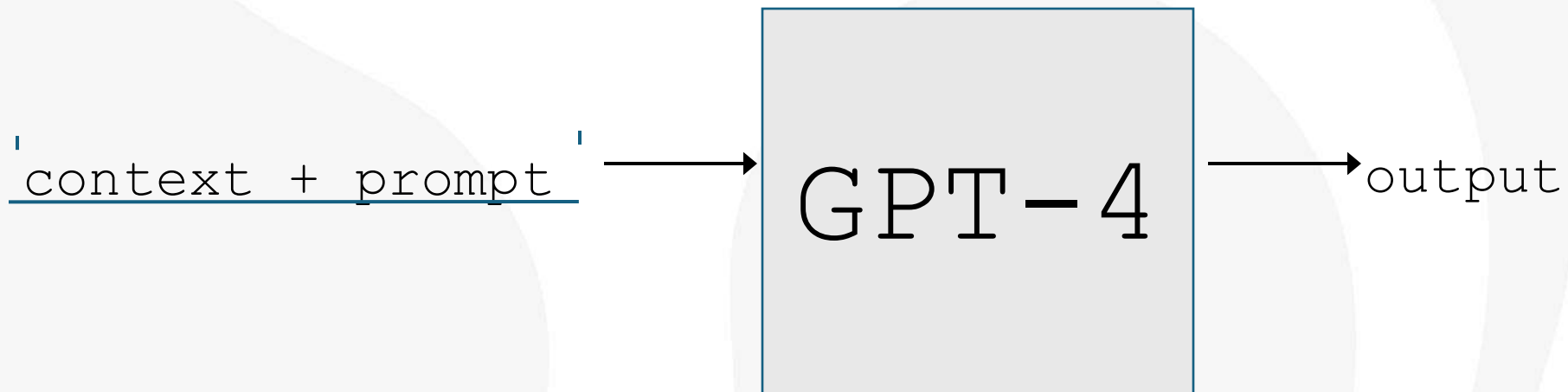


genAI and LLMs



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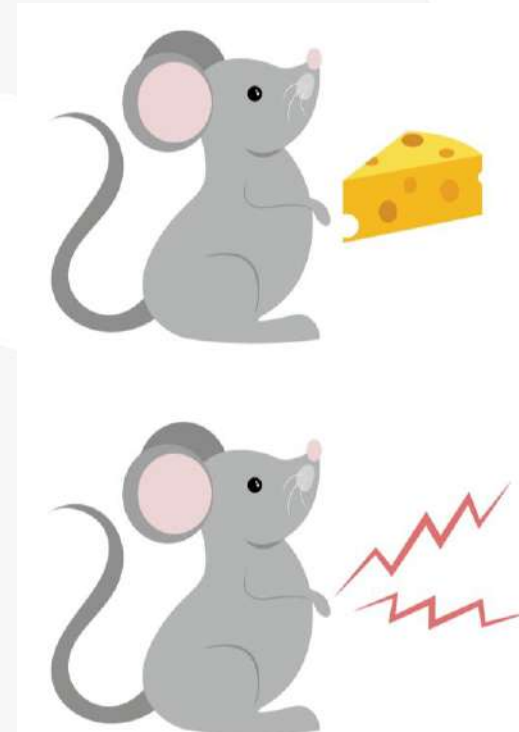
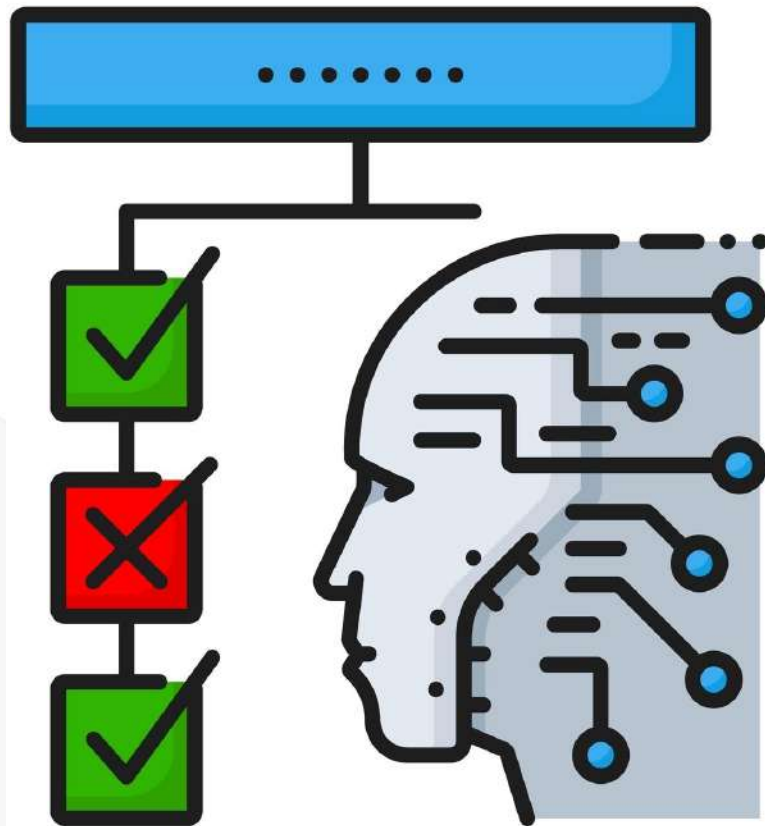
- ❑ Simple idea: Massive **deep neural networks** trained on vast amounts of text
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- ❑ Example: GPT



reinforcement learning



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key lesson: most AI is not genAI



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The opportunity for the agriculture sector



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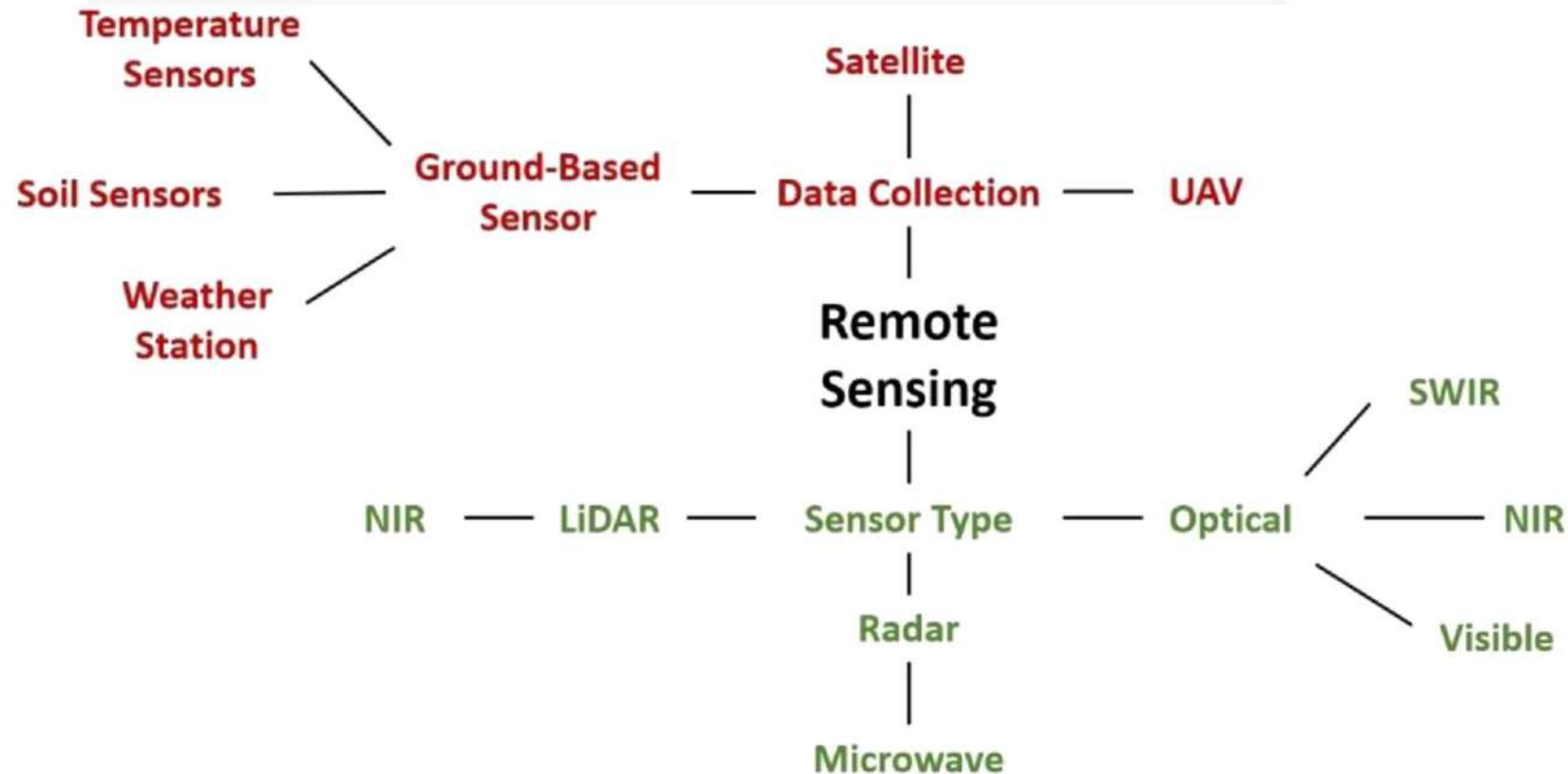


Massive amounts of rich data
soil moisture, weather, satellite/drone, pest and disease

The opportunity for the agriculture sector



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Strong feedback loop allows for self-healing systems

The opportunity for the agriculture sector



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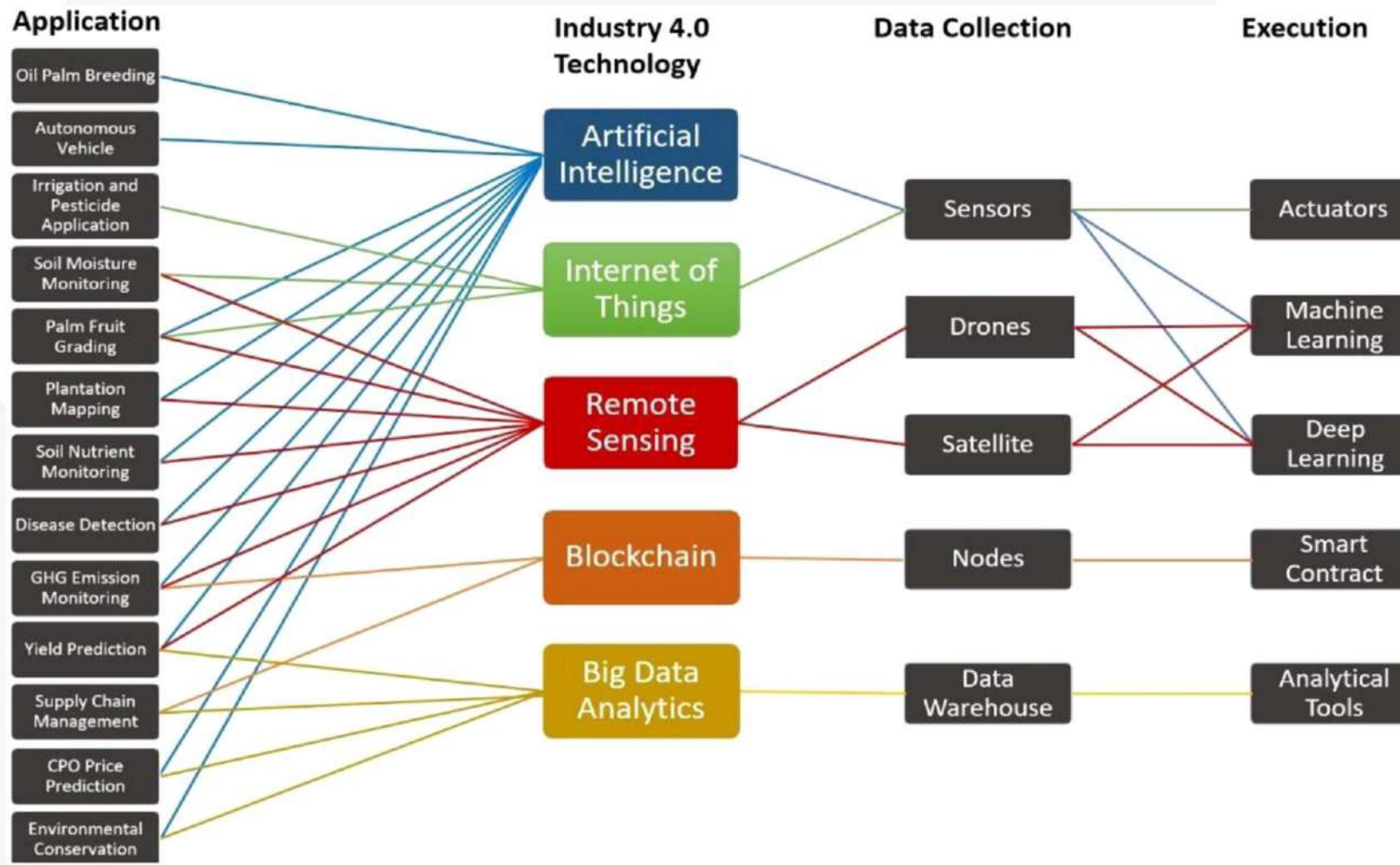


Resources are constrained, making the business case for AI investments

The opportunity for the agriculture sector



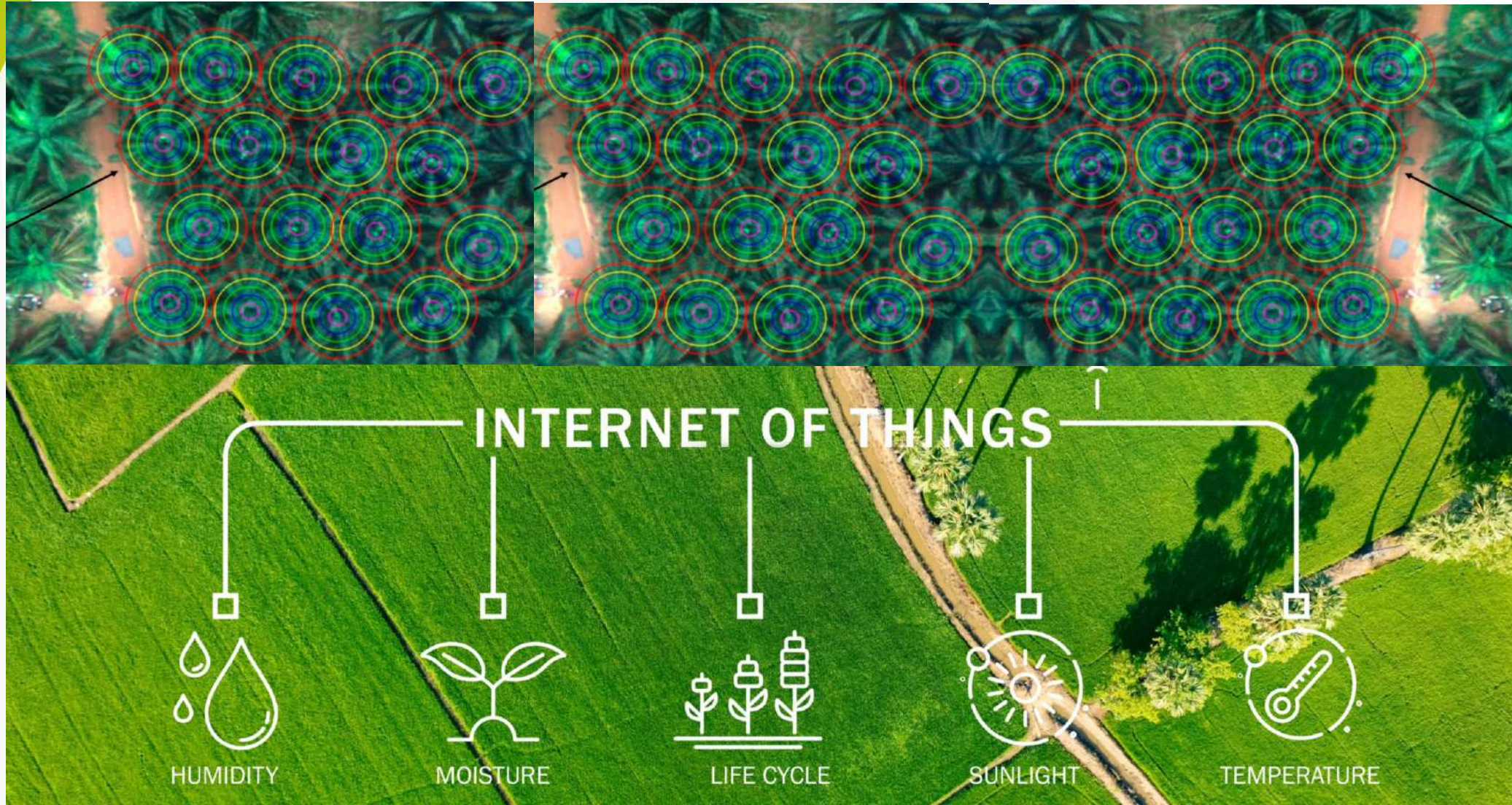
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The key differentiator for the agriculture sector



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Global examples of success



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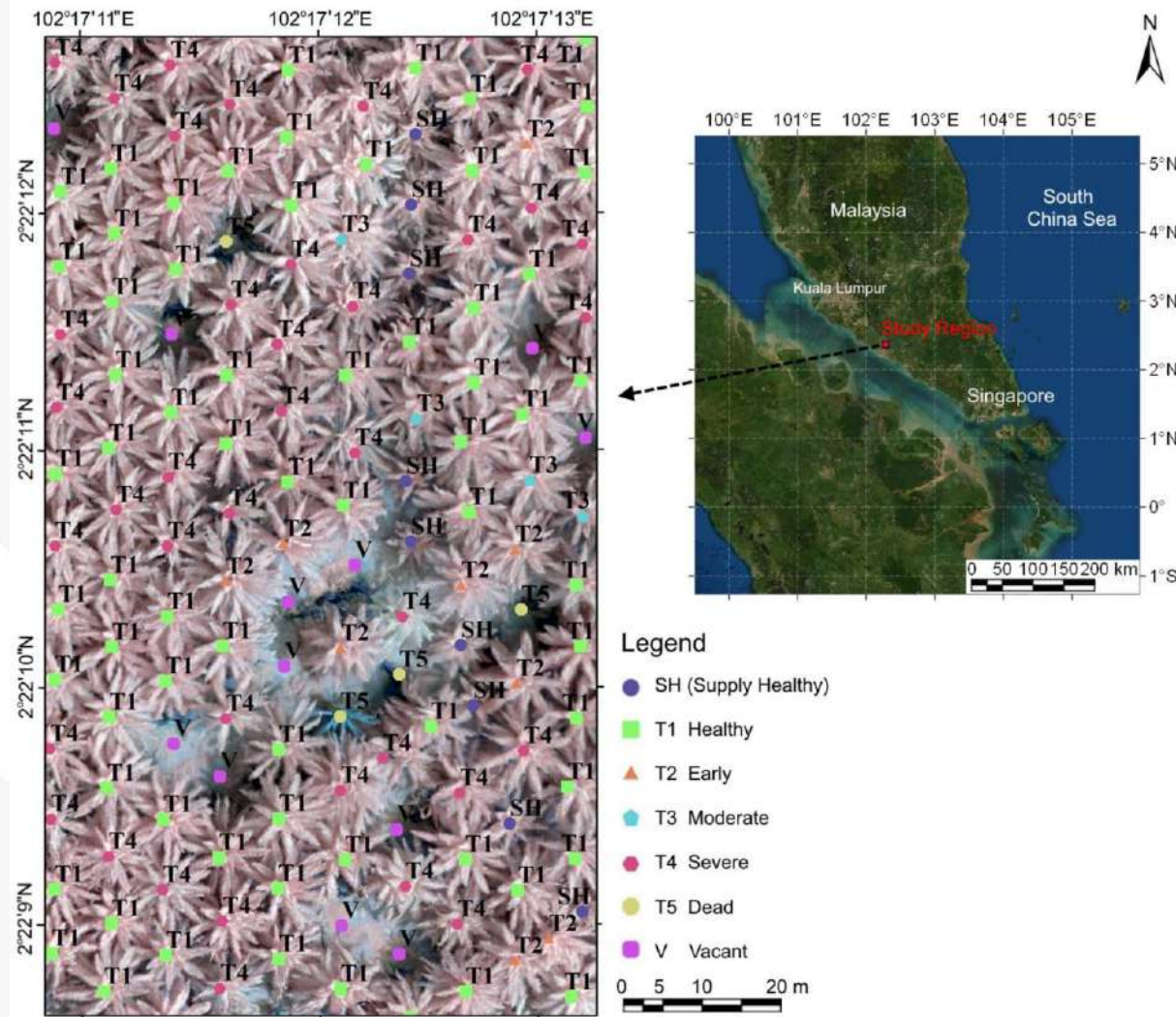


Deep learning for fruit ripeness monitoring

Global examples of success



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UAVs and deep learning for disease detection

Global examples of success



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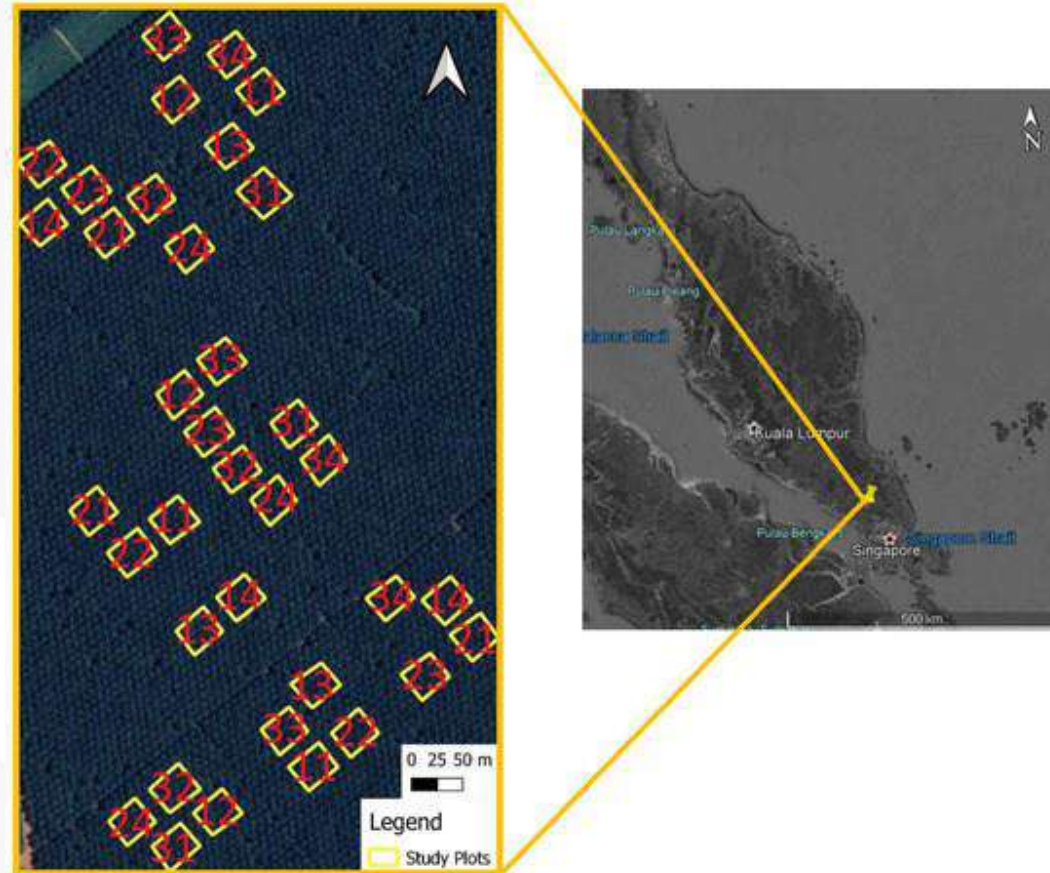


Deep learning for bud rot detection

Global examples of success



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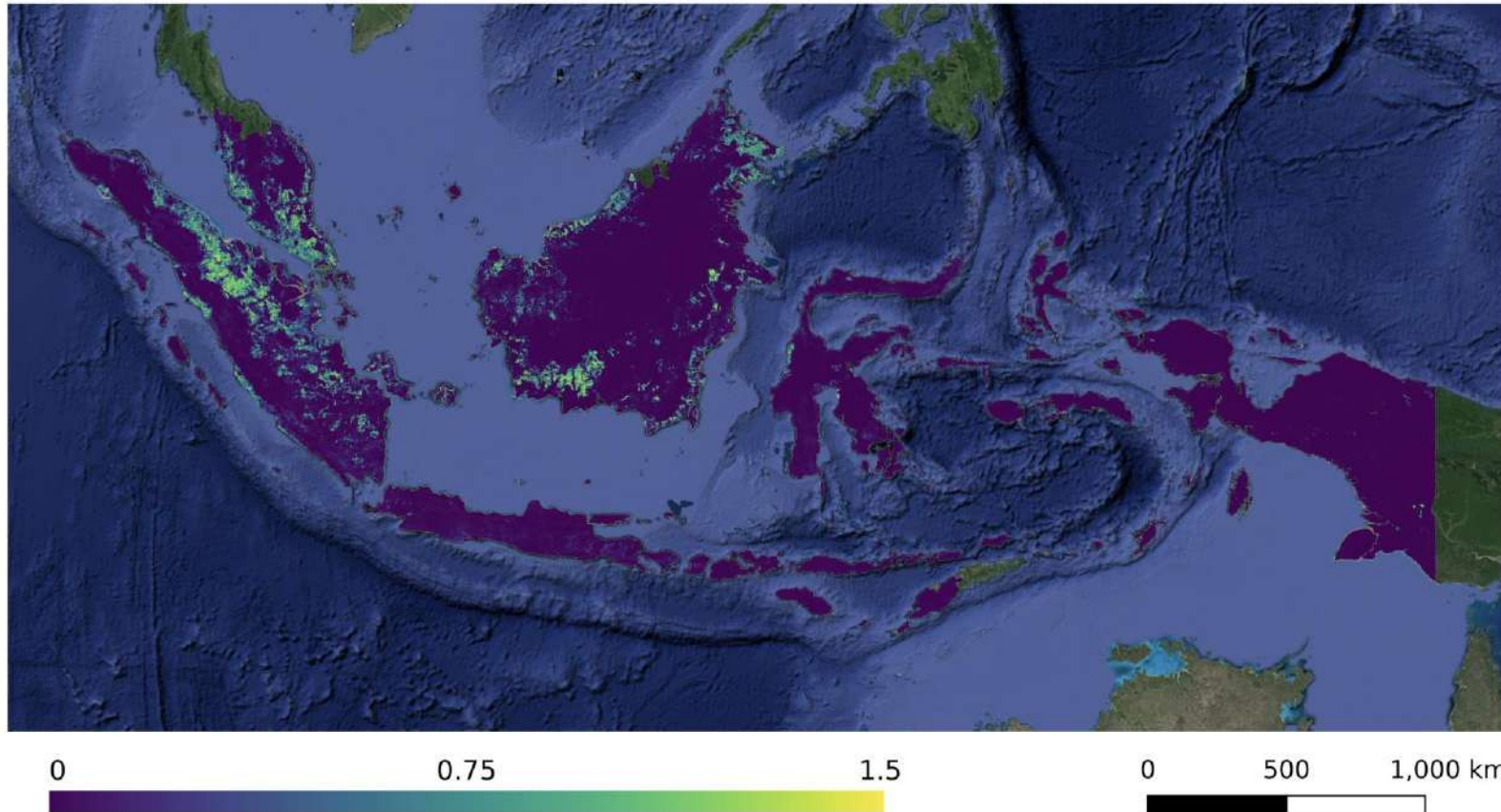


Satellite imagery for fertilizer detection using SVMs and random forests

Global examples of success



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Satellite imagery for density estimation

Key lesson: rethink your processes!



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Reimagine work to get real value from AI



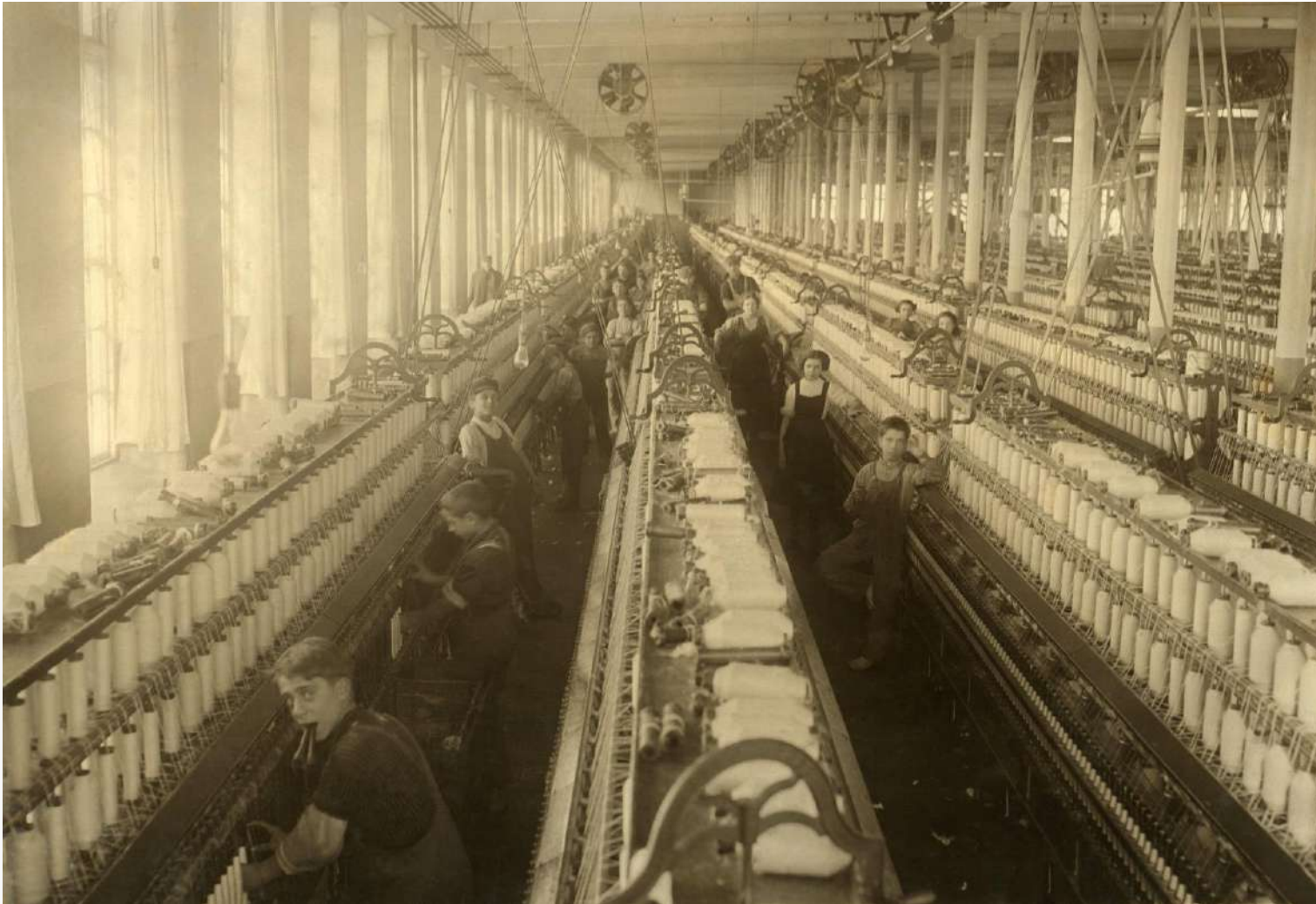
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Reimagine work to get real value from AI



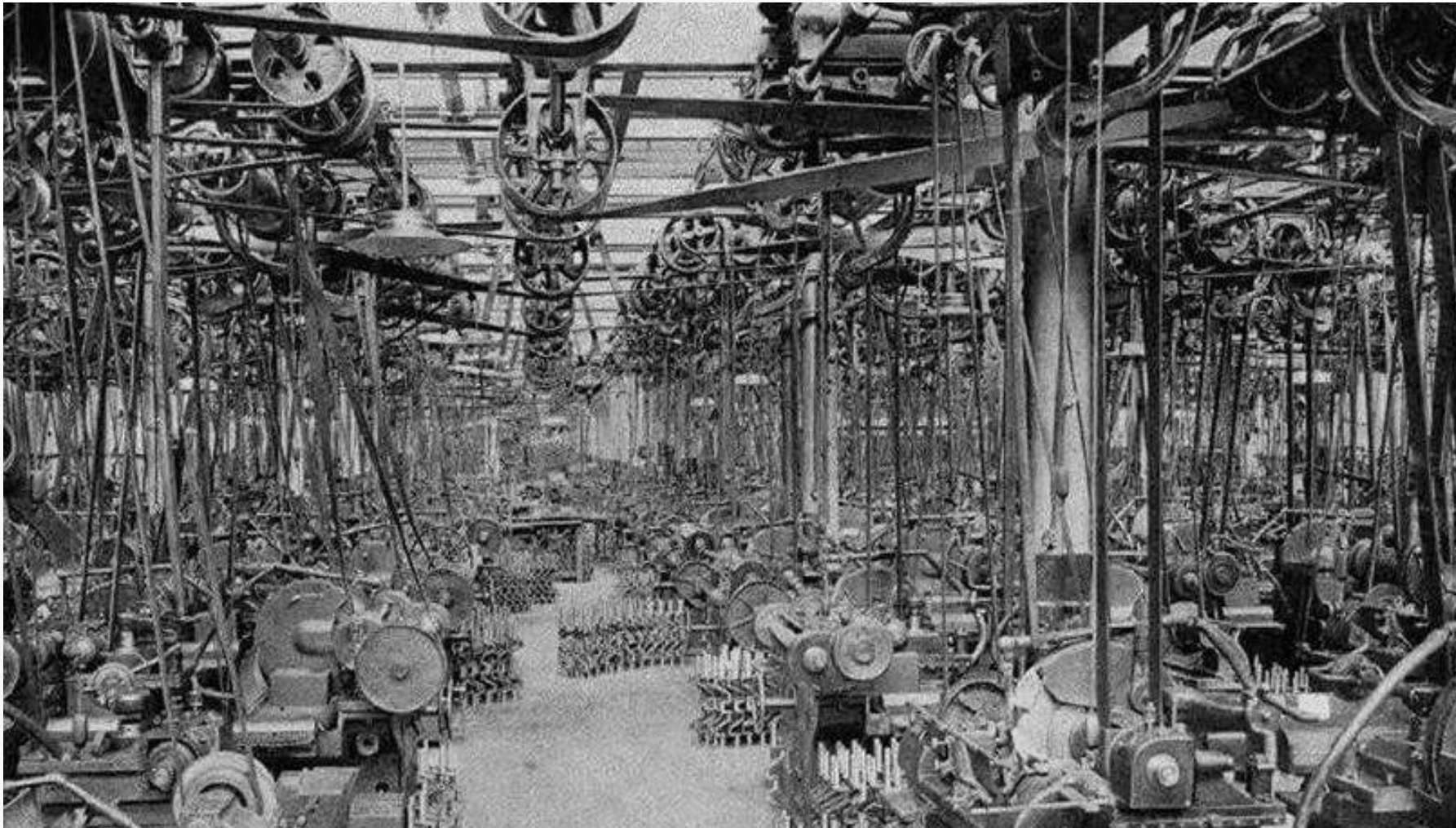
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Reimagine work to get real value from AI



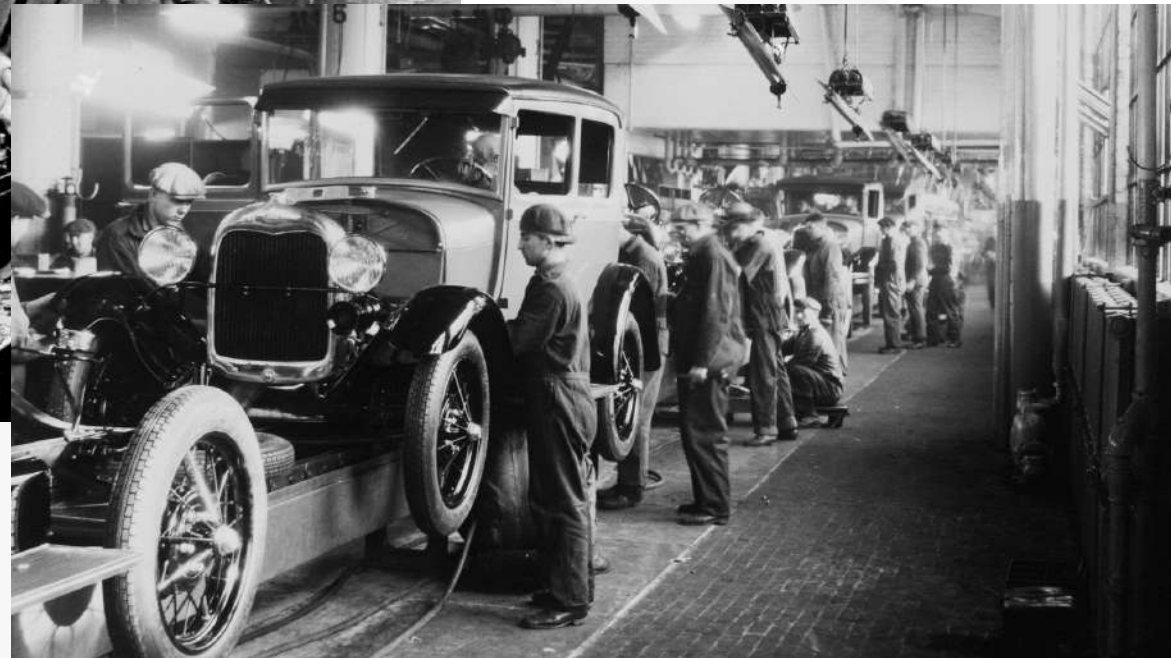
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Reimagine work to get real value from AI



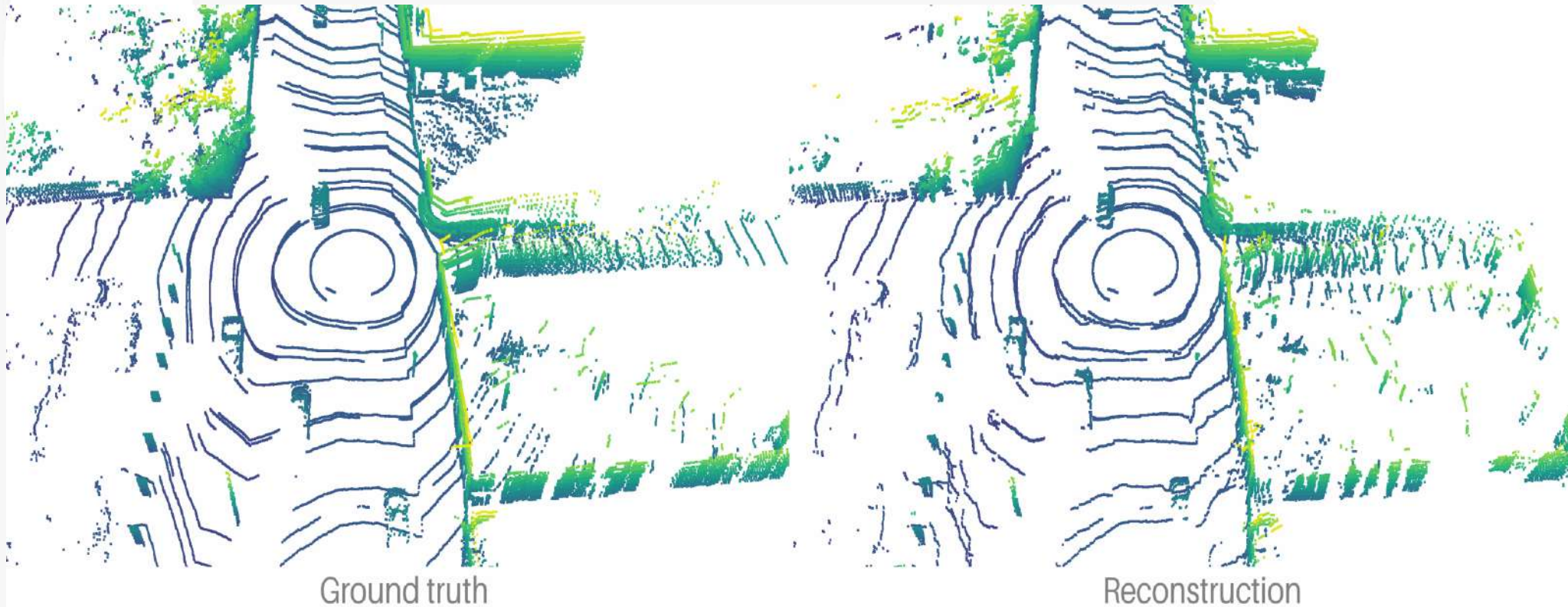
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the future: “world models”



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the future: “world models”



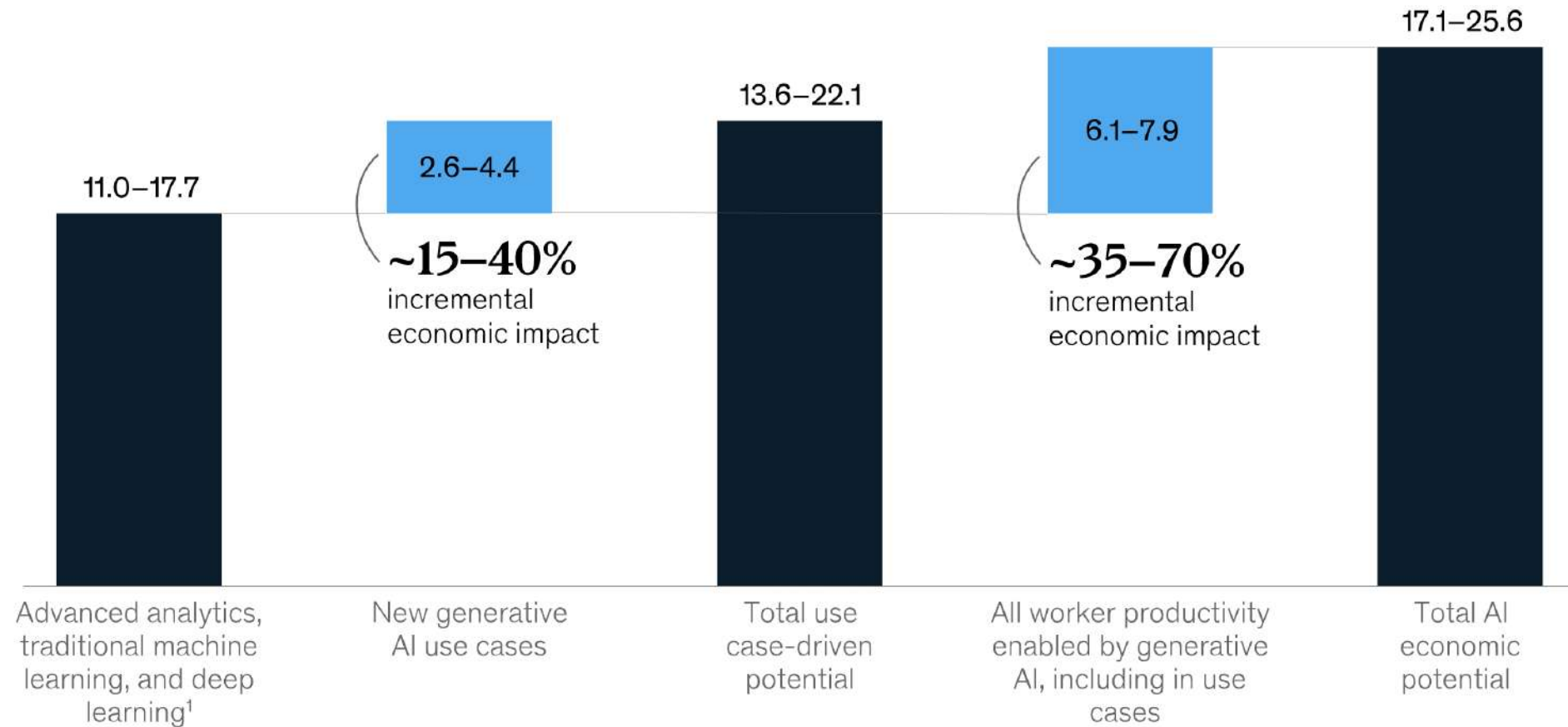
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global GDP and AI sovereignty



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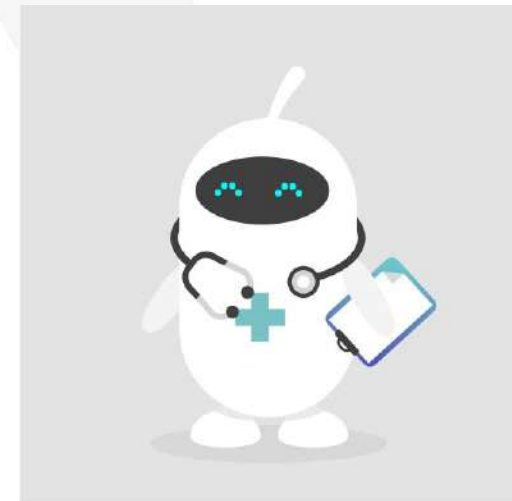


Source: McKinsey Global Institute, 2024

AI sovereignty and national autonomy



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MUCHAS GRACIAS

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2025

