kettle
Balancing Risk in a Changing Climate

We Use Deep Learning to Reshape the Reinsurance Industry

ourkettle.com

Nathaniel Manning & Andrew Engler
Our Team
Combines Technology & Reinsurance Experience

What we have done
Built $72M+ in new business at Argo Group using Digital + ML products

Built largest open source crisis response & mapping software platform in the world to 200,000+ deployments and 1M+ users

Andrew Engler - CEO
- VP of ML and Digital Products at Argo, built $72M+ in new product revenue
- Head of Commercial Operations - Allstate AZ

Nathaniel Manning - COO
- Six years CEO of Ushahidi, largest crisis response software platform.
- First Chief Data Officer, USAID

Son Le - CTO
- Head Quant Engineer at Argo
- Built tech that resulted in $72M+ of business
- Masters Mathematics, AI speciality Courant School NYU

Nigel Mortimer - Chief Underwriting Officer
- President, Executive VP at Argo - 12 years
- Built Argo from $800M to $2B/year gross revenue
- EVP of Product at XL Catlin, a $14B/year re/insurer

+ Additional engineering team of 2
Industry that is 630 years old, and still uses approved rubber stamps

Our Industry
Reinsurance is the Safety Net Below the Safety Net

$300B

Allstate insures millions of homes in CA

They can't handle a catastrophic event (like a wildfire), where they lose 50k+ homes at once

So they buy coverage from reinsurers, like Kettle.

Reinsurers, like Kettle, also pass risk to bigger reinsurers like MunichRE, or Capital Markets, like pension funds.
Our Problem
Climate Change & Globalization are Changing the Fundamentals of Reinsurance

3x
Increase In $1B+ Catastrophes Over Past 15 Years

68%
Drop in Reinsurance Return on Equity Over Last 10 Year

ROE of top 50 Reinsurers
Our Timing Is Perfect
Reinsurance is Going to be Remade

Outdated Models

$200B+ in claims from COVID-19 & Climate Crises

Tech & Data for ML now affordable and available

Insurtech focused on distribution

White Space
Reinsurers don't have AI experience, AI experts in insurance take a SaaS approach
The Models Are No Longer Working

Take the last 500 years, run 100k simulations

Era of simple pricing for merchant vessels

Era of stochastic pricing

Climate change takes effect, the models break down

Era of real-time, accurate pricing through ML

Predict the next 10 years using frequency of previous fires
Our Moat

Asynchronous Data (satellite imagery) + Swarm Neural Networks (derived from robotics) = 22%+ Higher Precision/Recall

We divide CA into 320,000 micro grids each 0.5 square miles

Get 320m satellite images in unstructured data

Translate into computer readable format through CV

Run a swarm of 115,456 separate neural network nodes

3x10^42 This equates to 42.3mm simulations and gives us...

84.7% Precision/recall Compared to 62% industry standard
Our Validation

Kettle Delivers
18% Higher Returns

Kettle RE Model
Prices risk at 0.5 sq miles

42M Simulations
84.7% Precision/Recall
7-20% Return on Capital

Standard Industry RE Model
Prices risk at state-wide level

100K Simulations
62% Precision/Recall
1-2% Return on Capital
We Use Deep Learning
To Price Our Reinsurance Products with High Resolution

1. Product is live
2. Pre-approved by Bermuda Authority for MGA or Class III Reinsurer
3. First customer, Allstate, in negotiation
4. Secured Guy Carpenter, second largest RE broker in the world
Our Business Model & First Customer

Because of Fire, Primaries Can’t Write $500M+ in Premium

Primaries are missing out on $500mm - $1bn in auto/homeowners premium because they can’t take fire risks.

Kettle covers portfolio of homes fire risk and charges a 30% premium, and transfers them to a reinsurer.

Kettle keeps 18% net revenue

75% - Capacity Provider

7% - Broker Fee (CAC)

18% - Net Revenue

"Kettle unlocks hundreds of millions of dollars of premium by eliminating wildfire risk."
- Bobby Feldman, CEO Largest Allstate Fire Broker CA

AmWINS Group, Inc.
Allstate
StateFarm
Munich RE
Renaissance Re
Our $238B+ Serviceable Market

We Will Diversify Our Risk Quickly Into Other Reinsurance Products

- **DEC 2020**
  - Flood v2.3
  - $8B Wildfire Market

- **MAR 2021**
  - Wind v1
  - $120B+ Flood Market
  - $50B+ Wind Market

- **DEC 2021**
  - Pandemic v1
  - Fully licensed Reinsurer
  - $60B+ Total Underinsured RE Market
An Opportunity in the Competitive Landscape

Large Market with White Space Between Tech and Reinsurance

- Entrenched reinsurers lack innovation in a $300B+ market
- Technology competitors don’t have reinsurance expertise, and take Saas approach, only a $8B market

- Munich RE
- Swiss Re
- HELIX re

- kettle
- AKUR8
- CAPE
- SOTERIS
Raising $4.6M To Give Us an 18 month Runway
And to hit $1M/month in recurring revenues
APPENDIX
Our Go To Market

License, first customer, capacity, and broker in negotiation → Land and Expand

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**RenaissanceRe**
- Bermuda license secured
- Capacity in negotiation

**Guy Carpenter**
- Our broker helps us expand
- 10 customers insure 80% of the $9B market

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**Allstate**
- First customer in negotiation,
- 5th largest CA insurer ($550M)
- Potential contract size of $90M

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Diversify and expand into flood, wind, and pandemic across USA
Raising $2.5 Million To Give Us 18 Month Runway

<table>
<thead>
<tr>
<th></th>
<th>Q3'20</th>
<th>Q4'20</th>
<th>Q1'21</th>
<th>Q2'21</th>
<th>Q3'21</th>
<th>Q4'21</th>
<th>Q1'22</th>
<th>Q2'22</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Contracts</strong></td>
<td>1</td>
<td>4</td>
<td>8</td>
<td>21</td>
<td>36</td>
<td>51</td>
<td>66</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td><strong>GROSS PREMIUMS</strong></td>
<td>$20,833</td>
<td>$187,500</td>
<td>$395,833</td>
<td>$1,020,833</td>
<td>$1,937,500</td>
<td>$2,875,000</td>
<td>$3,812,500</td>
<td>$4,750,000</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Cost of Capacity (75%)</td>
<td>$1,458</td>
<td>$13,125</td>
<td>$27,708</td>
<td>$71,458</td>
<td>$135,625</td>
<td>$201,250</td>
<td>$266,875</td>
<td>$332,500</td>
<td>$1,050,000</td>
</tr>
<tr>
<td>Broker fee/CAC (7%)</td>
<td>$17,083</td>
<td>$140,625</td>
<td>$296,875</td>
<td>$765,625</td>
<td>$1,453,125</td>
<td>$2,156,250</td>
<td>$2,859,375</td>
<td>$3,562,500</td>
<td>$11,251,458</td>
</tr>
<tr>
<td><strong>NET REVENUE</strong></td>
<td>$2,292</td>
<td>$33,750</td>
<td>$71,250</td>
<td>$183,750</td>
<td>$348,750</td>
<td>$517,500</td>
<td>$686,250</td>
<td>$855,000</td>
<td>$2,698,542</td>
</tr>
<tr>
<td>Personnel</td>
<td>$263,500</td>
<td>$288,500</td>
<td>$439,750</td>
<td>$439,750</td>
<td>$469,750</td>
<td>$469,750</td>
<td>$469,750</td>
<td>$469,750</td>
<td>$3,416,500</td>
</tr>
<tr>
<td>Direct Costs</td>
<td>$72,449</td>
<td>$87,116</td>
<td>$137,199</td>
<td>$137,199</td>
<td>$207,199</td>
<td>$207,199</td>
<td>$207,199</td>
<td>$207,199</td>
<td>$1,262,759</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES</strong></td>
<td>$353,032</td>
<td>$529,366</td>
<td>$901,532</td>
<td>$1,414,032</td>
<td>$2,265,699</td>
<td>$3,034,499</td>
<td>$3,803,199</td>
<td>$4,571,949</td>
<td>$16,979,259</td>
</tr>
<tr>
<td>Profit</td>
<td>($332,119)</td>
<td>($341,866)</td>
<td>($505,699)</td>
<td>($393,199)</td>
<td>($328,199)</td>
<td>($159,449)</td>
<td>$9,301</td>
<td>$178,051</td>
<td></td>
</tr>
<tr>
<td><strong>Cash in the bank</strong></td>
<td>$2,167,801</td>
<td>$1,825,935</td>
<td>$1,320,236</td>
<td>$927,037</td>
<td>$598,838</td>
<td>$439,389</td>
<td>$489,291</td>
<td>$626,741</td>
<td></td>
</tr>
</tbody>
</table>
## An Opportunity in the Competitive Landscape
Large Market with White Space Between Tech and Reinsurance

<table>
<thead>
<tr>
<th></th>
<th>The Current Reinsurance Market</th>
<th>Similar Tech, SaaS Biz Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>kettlè</strong></td>
<td><img src="image" alt="Swiss Re" /></td>
<td><img src="image" alt="HELIX RE" /></td>
</tr>
<tr>
<td><strong>Market Size</strong></td>
<td>$238B</td>
<td>$300B, $75B, $8B</td>
</tr>
<tr>
<td><strong>Product value</strong></td>
<td>More accurate &amp; can hold risk</td>
<td>Reinsure your risk, MGA - Can write and transfer risk, AI analytics as a service, AI analytics as a service</td>
</tr>
<tr>
<td><strong>Accuracy of models</strong></td>
<td>84.6%</td>
<td>62%, 62%, unknown, unknown, unknown</td>
</tr>
<tr>
<td><strong>Business model</strong></td>
<td>RE/Insure and transfer risk using AI models</td>
<td>Insure risk, Insurance provider who brokers risk, SaaS underwriting and data service, SaaS underwriting and data service, SaaS underwriting</td>
</tr>
<tr>
<td><strong>Our competitive advantage</strong></td>
<td>More accurate models = competitive pricing</td>
<td>More accurate models = competitive pricing, Larger market + we sell risk and earn % of premium vs selling SaaS, Larger market + we sell risk and earn % of premium vs selling SaaS, Larger market + we sell risk and earn % of premium vs selling SaaS</td>
</tr>
</tbody>
</table>
Team forms. Start researching and building.

- **PAST**
  - June 2019
  - September 2019
  - December 2019

- **NOW**
  - March 2020
  - June 2020
  - September 2020

- **NEXT**
  - December 2020
  - March 2021
  - June 2021

- **Build and test multiple products.**
- **Evacuation insurance, Fire model, etc.**

**Launch Wildfire product**

**MGA paper finalized**

- **Launch flood/wind products**
- **Pilot pandemic model**
- **Start holding risk ourselves**

**$100M in capacity secured**

- **$125k in monthly recurring revenue**
- **$250k in monthly recurring revenue**
- **$500k in monthly revenues**
Our Business Model
As An MGA We Analyze, Hold, & Transfer Risk

Our customers are insurance companies

Insurers buy reinsurance from us. Avg contract value of $250k/year

We use our models to analyze their portfolios, and we reinsure their risk

We transfer the majority of the risk to our capacity providers or to ILS. We keep 25% commission

Because our models are more accurate, we offer more accurate pricing and higher coverage
35%+ Of Risk Transfer Costs Can be Saved by Fixing Inaccurate Models & Inefficiencies

- **Broker writes insurance policy**
- **Insurer pools risk into portfolios**
- **The insurer reinsures their portfolios against catastrophic risk (through a broker)**
- **Reinsurers pool multiple policies and buy additional insurance from a Retrocessional (through a broker)**
- **Capital Markets buy risk as a bond, post collateral, and get a return on investment (through a broker)**
Our Data

1. 1.88 million wildfires in the U.S. - National Fire Program Analysis System
2. All weather data since 1980 - Arcgis
3. 26,000 weather stations with daily data feed - Arcgis
4. U.S. Landsat 4-8 Analysis Ready Data (ARD) Level-2 Tiles (Albers projection)
5. ASTER Global Emissivity Dataset 100-meter V003 - AG100
6. ASTER Global Emissivity Dataset 1-kilometer V003 - AG1KM
7. Global Food Security-support Analysis Data (GFSD) Cropland Extent 2010 North America 30 m V001
9. Global Multi-Resolution Terrain Elevation Data
11. Landsat 7 Enhanced Thematic Mapper Plus Collection 1 Level-1
12. Landsat 7 Collection 1 Level-2 Scene Products (Surface Reflectance)
13. MODIS/Terra and Aqua MAIAC Land Surface BRF Daily L2G Global 500 m and 1 km SIN Grid Version 6
14. MODIS/Terra and Aqua MAIAC Land Aerosol Optical Depth Daily L2G 1 km SIN Grid Version 6
15. MODIS/Terra and Aqua MAIAC BRDF Model Parameters 8-Day L3 1 km SIN Grid Version 6
17. MCD43A2: MODIS/Terra and Aqua BRDF/Albedo Quality Daily L3 Global 500 m SIN Grid Version 6
18. MCD43A3: MODIS/Terra and Aqua Albedo Daily L3 Global 500 m SIN Grid Version 6
20. MODIS/TERRA MOD09A1 Surface Reflectance B-Day L3 Global 500m Version 6
21. MODIS/TERRA MOD09QA Surface Reflectance Daily L2G Global 1km and 500m Version 6
22. MODIS/TERRA MOD09QC Surface Reflectance Daily L2G Global 250m Version 6
23. MODIS/TERRA MOD09QI Surface Reflectance 8-Day L3 Global 250m Version 6
24. MODIS/COMBINED MOD01A1 Land Surface Temperature and Emissivity Daily L3 Global 1 km Sin SIN Version 6
25. MODIS/TERRA MOD11A2 Land Surface Temperature & Emissivity 8-Day L3 Global 1km Version 6
26. MODIS/TERRA MOD11B1 Land Surface Temperature and Emissivity Daily L3 Global 5 km SIN Grid Version 6
27. MODIS/TERRA MOD11B2 Land Surface Temperature and Emissivity Daily L3 Global 5 km Grid SIN Version 6
28. MODIS/TERRA MOD11_L2 Land Surface Temperature and Emissivity 5-Minute L2 Swath 1 km Version 6
29. MODIS/TERRA MOD13A1 Vegetation Indices 16-Day L3 Global 500m Version 6
30. MODIS/TERRA MOD13A2 Vegetation Indices 16-Day L3 Global 1km Version 6
31. MODIS/TERRA MOD13Q1 Vegetation Indices 16-Day L3 Global 250m Version 6
32. MODIS/TERRA MOD14A1 Thermal Anomalies & Fire Daily L3 Global 1km Version 6
33. MODIS/TERRA MOD14A2 Thermal Anomalies & Fire 8-Day L3 Global 1km Version 6
34. MODIS/TERRA MOD14 Thermal Anomalies & Fire 5-Min L2 Swath 1km Version 6
35. MODIS/TERRA MOD15A2H Leaf Area Index - Fraction of Photosynthetically Active Radiation 8-Day L4 Global 500 m Version 6
36. MODIS/Terra Net Evapotranspiration 8-Day L4 Global 500 m SIN Grid Version 6
37. MODIS/TERRA MOD17A2H Gross Primary Productivity 8-Day L4 Global 500 m SIN Grid Version 6
38. MODIS/TERRA MOD17A2H Gross Primary Productivity 8-Day L4 Global 500m SIN Grid Version 6
39. MODIS/TERRA MOD11B1H Gross Primary Productivity 8-Day L4 Global 500m SIN Grid Version 6
40. U.S. Landsat 4-8 Burned Area (BA) Landsat Science Product Tiles (Albers projection)
41. U.S. Landsat 4-8 Dynamic Surface Water Extent (DSWE) Landsat Science Product Tiles (Albers projection)
42. Shuttle Radar Topography Mission 1 Arc and 3 Arc Second Digital Terrain Elevation Data
43. Shuttle Radar Topography Mission 1 Arc and 3 Arc Second Digital Terrain Elevation Data - Void Filled
44. NASA Shuttle Radar Topography Mission (SRTM3) Global 1 arc-second
45. NASA Shuttle Radar Topography Mission (SRTM3) Global 3 arc-second
46. NASA Shuttle Radar Topography Mission (SRTM3) Global 30 arc-second
47. NASA Shuttle Radar Topography Mission (SRTM3) Global 3 arc-second sub-sampled

1.2 terabytes of local data
3 petabytes of total available data
A PICTURE IS WORTH A THOUSAND WORDS

The most important data for underwriting is unreadable by computers (satellite images, weather maps, etc.)

Every image, video, document, or file is a soup of data points

We built an ETL pipeline to notate and order all this unstructured data to run our insurance models
Swap Markets Allow for dynamic pricing and liquidity

Instead of pricing large areas using inaccurate historical data

Use real-time, hyper accurate Swarm NN to produce precision priced products

Create hyper specific returns and match them to markets with appetite

Zip 91024
$25m xs $125m
4% ROL
1 year term
Low Level Risk

Zip 91011
$50m xs $75m
18% ROL
6 month term

4-20% YoY ROI
Our Summary
We are Using Deep Learning to Reshape the Re/Insurance Industry

We sell reinsurance to insurers and then transfer that risk, as a Managing General Agent (MGA/MGU)

We use advanced deep learning to assess, underwrite, and transfer risk to deliver **27% higher Return on Capital**

First product complete. Bermuda license pre-approved. In conversations with Allstate as first large customer, and RenRe and AIG as first capacity providers.

Raising $2.5M to give us 24 months runway. To become the most advanced risk analysis and transfer platform in our $350B serviceable market.