GAX
Game-changing Accelerator

GAX, Inc.

FOR Kaizen conference

August 23, 2020

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LA TORCHE

SPIRAL VENTURES

PRIVILEGE BARBECUES

SMBC日興証券

Began working at Nikko Cordial Securities (now SMBC Nikko Securities) after graduating university. Assigned to the Kobe branch. Awarded a place in company rankings for developing high-net-worth clients from his first year. Has won many awards for profit rankings and fund implementation competitions, among others. At the age of 30, he moved to Singapore on his own and founded a self-funded business. Launching Privilege Barbeques (www.p-bbq.com), a BBQ food delivery service, he eventually sold the company in January 2015 to a local warehouse operator. In April of the same year, he joined Spiral Ventures, where he was in charge of fundraising. In January 2018, he began working at La Torche, Inc., a company that focuses on business development consulting, as an executive director in charge of new business development. In December of the same year, he founded GAX, Inc. as a spin-off business to work on off-shore AI development projects.
He graduated from Hosei University.

◆ Operational Structure
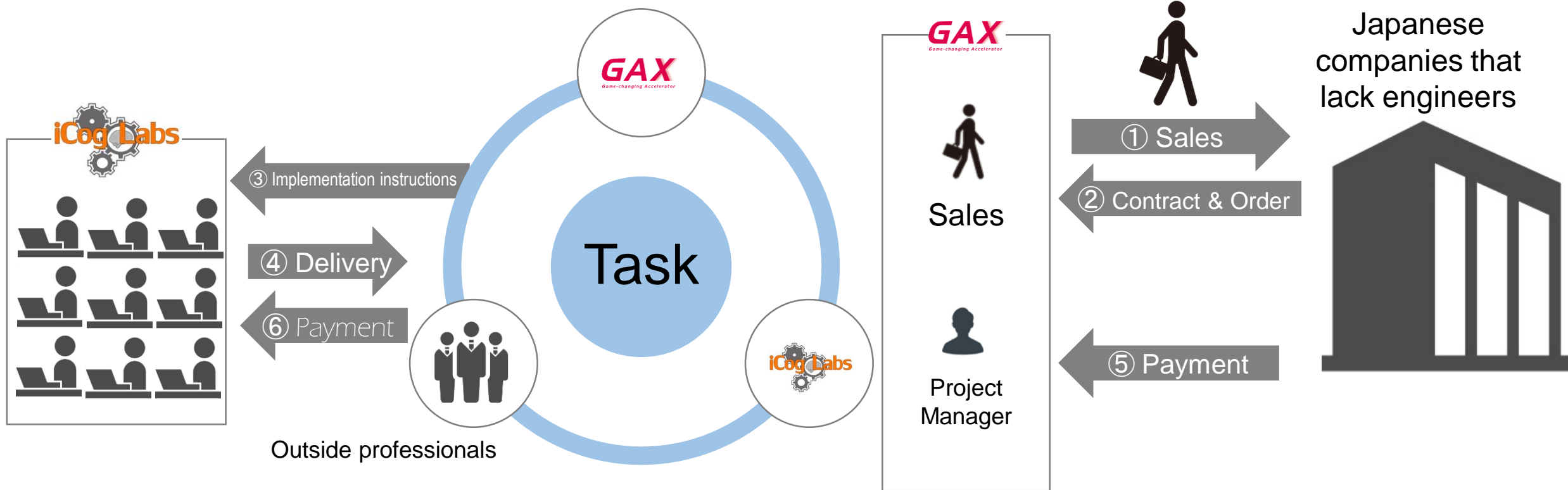
Professionals who continue to learn the most advanced technology

Getnet Aseffa Bitseat Tadesse Dagim Sisay Betelhem Dessie Simon Mekit Mitiku Yohannes Hana Sinishaw Israel Abebe

Eskender Besrat Eskender Tamrat Kasim Ebrahim Meareg Hailemar Tensae Berhan Tesfa Yohannes Yenatfanta Shifferaw Yidnekachew Wondimu

iCog Labs

About 30 of Ethiopia's most talented engineers on staff, mostly machine learning engineers.

Visit to Ethiopia by Professor Matsuo and members of University of Tokyo's Matsuo Lab (AI Research)

"Compared to Ethiopia's infrastructure, this was the only place that was state-of-the art."

The members of University of Tokyo's Matsuo Lab, including Professor Matsuo were surprised at the high level of quality when they visited Ethiopia.

The high level of technical capabilities was selected by the Silicon Valley Singularity University team to tackle the difficult problems of humanity using advanced technology.

People thought highly of iCog Labs, but were unsure about their specific value. We tried to put it into words many times, but there was never a clear answer from Getnet.
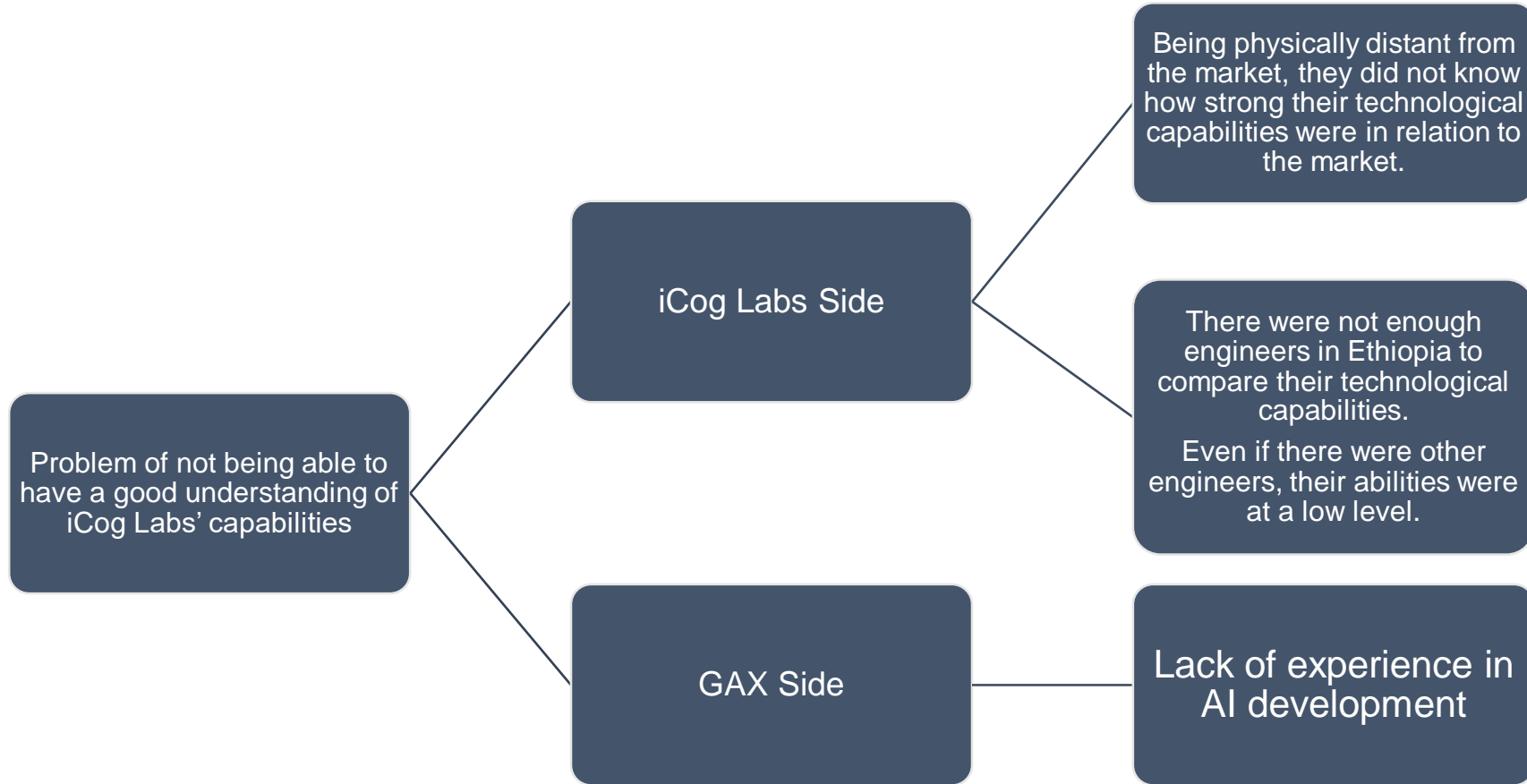
What Getnet always told us was:

We can do anything.

But with just these strong words, we still did not know exactly what they could do, and at what level.

Where was the problem?

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Problem of not being able to
have a good understanding of
iCog Labs' capabilities
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iCog Labs Side
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Being physically distant from
the market, they did not know
how strong their technological
capabilities were in relation to
the market.
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There were not enough
engineers in Ethiopia to
compare their technological
capabilities.
Even if there were other
engineers, their abilities were
at a low level.
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GAX Side
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Lack of experience in
AI development
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◆ Measures taken on the GAX side

- Satoru Akama led the survey on iCog Labs' capabilities.
- All the iCog related personnel on LinkedIn were found.
- After extracting their names on Github, the repository was searched to check the details of past open source projects.
- iCog members were interviewed and asked questions about their role in each of the projects in which they were involved.
- The skills of each individual could then be put into words.

Satoru Akama <akama@gax-tech.com>
After receiving a PhD from the Tokyo Institute of Technology, he worked for three years as a university researcher, analyzing genetic data using data mining and other methods. In 2015, he began working on projects related to big data and AI, which are still in their infancy, at a major IT vendor and general consulting firm for about three and a half years. During his tenure, he acquired experience in more than ten verification and validation phases in a wide range of areas including retail, manufacturing, and insurance. He currently owns his own business (sole proprietorship) and works freelance as a technical advisor on the use of AI. After starting his business, he has been advising start-ups and conducting technical research for major corporations.

◆ What was noticed after visualization was performed?

- By visualizing each person's capabilities, we were able to see the number of potential leaders and have a sense of their individual levels when receiving orders. This allowed us to understand the scale of the projects we should accept, in terms of both size and cost, causing us to change our approach to sales.

- Based on the skill sheets, we could understand where the organization was weak and where it was strong. This showed us when to outsource, to compensate for any weaknesses in project execution. The teamwork between GAX and iCog was thus strengthened.

- We have successfully reached a common understanding with our partner company iCog about the goals for skill sets that should be strengthened in the future. Currently at iCog, these results are being used for skills training for individual staff members.

◆ The intrinsic value of iCog Labs that became visible

- iCog Labs is a group of "geeks" who like to learn while using their own brains and hands to write code and manipulate robots and other IoT devices.

- In particular, the top six senior engineers are of a very high caliber. Even in Japan, they would likely be regarded as top engineers. One of them presented a paper on GAN (generative adversarial networks) in the field of machine learning. Another engineer with a strong background in IoT was rated as excellent by a Japanese engineer who a member of Google X (the project responsible for developing Google's next-generation technology).

- All six have PM experience, as well as experience in middle management positions. They have the potential to solve the problem of the lack of middle managers, which is common in emerging countries.

- The junior class of engineers is also eager to learn. One of them has completed Stanford University's online computer science course in machine learning via Coursera.

- They were also active in OSS (open source software) development, actively sharing their work with the world through Github. Many of the engineers want to make the world a better place through software.

◆   Examples of acquiring projects and improving company performance

- An order for the development of a system for new business development was received from and delivered to the Motorcycle Division of Honda Motor Co., Ltd. They were satisfied with the quality and we continue to receive maintenance contracts from them. We are planning to receive an order from them for the development of a new system once there is more perspective on the coronavirus problem.

- We were asked by a tech company with major clients such as Sony and Mitsubishi Electric to update their services using AI.

- An AI tech company, who was already very busy with existing projects, approached us for assistance in launching their own services (currently in progress).

- We are in the process of proposing a new business idea for a tech company that is running an off-grid business using big data.

Our Company's Kaizen - Conclusion
Instead of looking for something that isn't there, look for something that is there.

- We believe there is "good visualization" and "bad visualization."

- There is a tendency to think that standards in developed countries are at a certain level that is higher, so we must bring our level up to match that; however, we feel that is wrong.

- Instead, each individual has a certain skill set, which is of a level that can be globally competitive, so we should focus on those skill sets, sharing our technical capabilities and training know-how with the team to win more work. This is the most important idea (looking for something that is there instead of something that isn't).

Appendix

Examples of interview questions and other items that were checked

No	Name	Skill check	Resume	LinkedIn	icog-acc (https://www.icog-acc.com/)	Source	Note1	github (gitlab)	AI skills	Programming language with development experience (level 3 or higher)	Hardware Electronics(Arduino, Rasberry Pi 3D Printer, Other)	Software Backend (Java)	Software Backend (PHP)	Software Backend (C#)	Software Backend (Ruby)	Software Backend (Pearl)	Software Backend (NodeJS, Other)	Software Frontend(HTML)	Software Frontend (JavaScript)	Software Frontend Vbscript)	Software Frontend (Siliverlight, Other)	Mobile Software(iOS)	Mobile Software(Android / Windows Phone)	Data Analytics(MATLAB)	Data Analytics(Python)	Data Analytics(R:Tensorflow)	Data Analytics(C++)	UI/UX Design	Current Position	Country	iCog Position	University/n Degree/ Major	Grad year	Skill evaluation	Self-introduction	Project	AI skill level	Breakdown of AI skills	Robot skill level	Notes

What we want to clarify as a skill

The difference between practical development experience and simply studying and being able to use it
→ Perhaps "implementation experience" is a better term since many people have little or no experience in real projects.

Programming languages that can be used professionally
Member list

Example items:
Education and major (year of graduation)
Development experience (project experience)
Programming languages that can be used
Experience in using machine learning
Experience in using machine learning libraries
Work experience in image recognition (e.g. experience in using opencv)
Work experience in text analysis
Work experience in voice recognition
Work experience in chatbot development
Experience with deep learning (experience in using machine learning frameworks like TensorFlow for work)
Experience with time series data analysis
Development experience in cloud environments (e.g. AWS or GCP)
Docker, Kubernetes development experience
Experience in developing applications for robots (considering C## and ROS, etc.)
Experience in developing web applications
Experience in developing mobile applications
(data handling for large-scale log data)
Handling of sensor data such as LiDar

Examples of questions related to motivation:
What industries and sectors are you interested in?
What technology are you interested in?
What kinds of projects do you want to be involved with in the future?
What skills do you want to develop in the future?

Appendix

An example of the skills axis in the data science field and the content of deep learning technology classes on Coursera.
This was used to put the skills of students who studied at Coursera into words.

	Business problem solving capabilities	Data science capabilities	Data engineering capabilities
① Senior Data Scientist Industry-leading level	· Can produce an impact on an organization-wide or market-wide level as an industry-leading data professional -Isolate issues in the target business or industrial field, clarify and structure points at hand -Develop new areas of data analysis and utilization -Build and promote a data consortium across organizations, companies, and industries -Create value chains based on data analysis of businesses and industries	· Breaks through the limitations of existing methods in data science and opens up new areas where problems can be solved. -Development, implementation, and lateral deployment of new analytical approaches for issues that are difficult to address with existing methods -Ability to design, drive, and complete approaches to high-level analysis projects	· As a leading architect in the industry, can consistently deliver the planned analytical approach in the data science field, even if it is a challenging task. -Building and optimizing data systems of exceptional sizes or data products that integrate multiple data sources -With a knowledge of technical limitations, presenting and implementing unprecedented alternatives
② Full Data Scientist Mastery level	· Can make business decisions and solve problems as a professional committed to the value you create, embodying what it means to be a data scientist. · Can identify and structure essential issues and variables, and design and execute an appropriate analytical approach, even when confronting a particular business area for the first time or when the scope spans multiple businesses. · Can synthesize results needed to solve the problem and share them in a convincing manner to move relevant organizations and people, deploy knowledge laterally, and connect beyond the organization. · Can drive projects with multiple teams of professionals, commit to the overall output, train members, and create a sustainable development system.	· Can play a major technical role data analysis projects by utilizing applied data science-related skills such as prediction, grouping, machine learning, visualization of large amounts of data, and language processing. · Can design, implement, and delve deeper into appropriate analysis approaches, even when confronting a particular business area for the first time or when the scope spans multiple businesses. · Can develop the skills of members at the level of Associate Data Scientist (stand-alone level) or lower in teams with multiple or advanced analysis projects.	· Can drive data analysis projects in a central role by utilizing data engineering skills related to defining requirements and designing multi-billion record analysis environments, data collection/storage/processing/sharing processes, and IT security. · As an architect who oversees the whole project, can comprehensively understand which data is related to each function of the service, and utilize it in design and development while understanding new technologies. · Can develop the skills of members at the level of Associate Data Scientist (stand-alone level) or lower in teams with multiple or advanced analysis projects.
③ Associate Data Scientist Independence level	· Can make business decisions and solve problems as an independent professional in most cases · Can identify and structure a problem to be solved, even if it is a new problem in a known area or theme, and then design, implement and deepen analysis approaches based on that identification and structuring. · With insight beyond the surface implications of data and analysis results, can autonomously compile the results of a project's studies, explain them onsite, and implement them. · Can commit to driving a project and producing an output with team of about five professionals. -Issue-driven and speedy decision-making -Project management and individual member development -Collaboration with experts and providers in different skill areas	· Can advance data analysis for a single project while consulting with a Full Data Scientist (mastery level) · Can provide appropriate direction for the daily activities of an Assistant Data Scientist (apprentice level) · Can design, implement, and delve deeper into new analysis approaches, even for new issues, if they are in known areas or themes. · Can perform basic data processing autonomously. -Handling outliers, abnormal values, and missing values -Creation of appropriate learning data, validation data, and test data -Creation of effective data through feature engineering · Can perform basic analysis activities autonomously. -Multiple regression analysis with multicollinearity -Understanding the limits of the p-value and realistic response -Non-hierarchical cluster analysis with appropriate number of clusters -Time series analysis with an understanding of the characteristics of series data -Machine learning and deep learning using libraries, etc. -Image pattern extraction and audio noise removal -Basic document structure analysis and vector representation using morphological analysis	Can autonomously process data and build environments for tens of millions of records. -System requirement definitions according to data importance and analysis requirements -Creation of appropriate data flow charts, logical data models, ER diagrams, etc. -Selecting data to be managed in Hadoop or Spark -Appropriate use of SDKs, APIs, libraries, container technology, etc. -Understanding and execution of SQL syntax -Understanding the logic of analysis programs and verifying analysis results -Understanding data anonymization methods and designing data processing solutions · Can design and implement infrastructure environments (GPW/CPU, cloud/on-premise, etc.) according to analysis requirements.
④ Assistant Data Scientist Apprentice level	· Has acquired a code of conduct and judgment as a data professional who understands the importance of logic and data in business. -Understanding data handling ethics and laws -Commitment to finishing what you start, without running away from it -Prompt reporting and a swift understanding of issues pointed out in reports · Has become familiar with the basics of data-driven analytical approaches, and when given a hypothesis or a known problem, can obtain, analyze, and compile the necessary data. -The ability to make decisions about any duplication or omission of data and events -Setting targets prior to analysis -Acquiring data for a purpose -Putting the meaning of the analysis results into correct words -Understanding the importance of monitoring · Can understand the basic framework of the issues in your area of study -Key variables (KPIs) of the industry you are responsible for -Basic business framework	· Has a basic knowledge of statistical mathematics, linear algebra, differential and integral calculus (e.g., representative value, variance, standard deviation, normal distribution, conditional probability, population, correlation, Bayes' theorem, calculation of vectors and matrices, relationship between slope and derivative of functions, etc.). · Has a basic knowledge of data analysis. -Preparation of data for analysis -Modeling for forecasting, grouping, etc. -Evaluation of the model · Understands the basic concepts of machine learning. -The difference between supervised and unsupervised learning -Understanding overlearning in machine learning · Able to perform data processing when given appropriate instructions. -Checking basic statistics, basic distributions, and pre-processing (e.g. removal, conversion and standardization of outliers, abnormal values, and missing values) · Has a basic knowledge of data visualization -Axis extraction -Understanding inappropriate expressions -Deriving meanings	· Has a basic knowledge of data and databases. -Discrimination of structured/unstructured data and creation of logical models -Understanding ER diagrams and table definitions -General understanding of SDKs and APIs · Has data-processing skills to process hundreds of thousands of cases. -Can sort, combine, aggregate, and filter -Can implement programs based on the design documents · Can do the following when given appropriate instructions: -Extract data from the database that meet the criteria -Import, insert records, and export · Has a basic knowledge of security (the three elements of confidentiality, availability, and integrity)
Not ready to be a data scientist	· Thinks that business is something that can be done with intuition and experience alone. · Has no awareness of quantification when solving a problem. · Lacks an awareness of the rights attached to data and personal information.	· Does not correctly understand the meaning of basic statistics. · Does not understand the basics of linear algebra and differentiation/integration. · Divides exponents with exponents. · Accepts the concept of "average annual income." · Improper use of graphs and charts.	· People can read the numerical summaries in their reports, but they are not particularly memorable. · Cannot aggregate data or use functions in spread sheets.

https://github.com/enggen/Deep-Learning-Coursera

Course 1. Neural Networks and Deep Learning
· Week1 - Introduction to deep learning
· Week2 - Neural Networks Basics
· Week3 - Shallow neural networks
· Week4 - Deep Neural Networks

Course 2. Improving Deep Neural Networks Hyperparameter tuning, Regularization and Optimization
· Week1 - Practical aspects of Deep Learning - Setting up your Machine Learning Application - Regularizing your neural network - Setting up your optimization problem
· Week2 - Optimization algorithms
· Week3 - Hyperparameter tuning, Batch Normalization and Programming Frameworks

Course 3. Structuring Machine Learning Projects
· Week1 - Introduction to ML Strategy - Setting up your goal - Comparing to human-level performance
· Week2 - ML Strategy (2) - Error Analysis - Mismatched training and dev/test set - Learning from multiple tasks - End-to-end deep learning

Course 4. Convolutional Neural Networks
· Week1 - Foundations of Convolutional Neural Networks
· Week2 - Deep convolutional models: case studies - Papers for read: ImageNet Classification with Deep Convolutional Neural Networks, Very Deep Convolutional Networks For Large-Scale Image Recognition
· Week3 - Object detection - Papers for read: You Only Look Once: Unified, Real-Time Object Detection, YOLO
· Week4 - Special applications: Face recognition & Neural style transfer - Papers for read: DeepFace, FaceNet

Course 5. Sequence Models
· Week1 - Recurrent Neural Networks
· Week2 - Natural Language Processing & Word Embeddings
· Week3 - Sequence models & Attention mechanism