NATIONAL SECURITY AGENCY
TECHNOLOGY TRANSFER PROGRAM

Office of Research & Technology Applications

8 Steps TO LICENSING AN NSA PATENT

1 DISCOVER
Discover NSA technologies in our patent portfolio, available in hard copy and online.

1,330 jobs created as a result of NSA's Patent License Agreements (PLAs).

TechLink and CU Business Research Division, 2000-2014

2 IMAGINE
Imagine fueling your business's growth with NSA technology, or building a business around NSA technology.

3 CONNECT
Contact us and move from idea to innovation!
tech_transfer@nsa.gov

4 ENGAGE
Meet with our inventors.

5 PITCH
How will you use our technology?
Tell us your business plan.

NSA's PLAs fueled **$346 million** in economic impact.

TechLink and CU Business Research Division, 2000-2014

6 NEGOTIATE
Let's make a deal! Sign a Patent License Agreement.

7 ACQUIRE
Get the know-how and bring your idea to life!

NSA's Technology Transfer Program (TTP) is small business friendly. Small businesses account for **99.9% of all businesses in the US.** *sba.gov*

8 CREATE
Create new products, services, businesses, and jobs. Strengthen the economy!

NSA's TTP has **proven economic impact.** Improving our economy creates stability, which increases national security.

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The National Security Agency's (NSA) Technology Transfer Program (TTP) is igniting innovation through Patent License Agreements with industry partners. Below is a sampling of the **many NSA technologies** available for license. To view a complete listing, visit us at *www.nsa.gov/techtransfer*. We may have exactly what your company needs to gain a competitive edge in the marketplace.

CONTACT US TO GET STARTED

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DATA SCIENCE

AVAILABLE FOR LICENSING

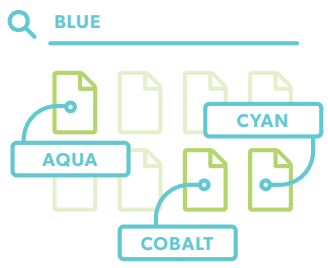
Word Pair Relevancy

This technology enables a user to find relevant documents within a large set of data without requiring the keyword to appear in the document and then ranks the results.

By auto-associating words and documents with a keyword, this method spares the user from needing to know precise terms when searching in a large database or network. Requiring only a large corpus of reference text, this technology is language agnostic and ranks the relevancy of documents to a keyword based on word pair relevancy estimated from the corpus of reference text.

POTENTIAL APPLICATIONS:

- Knowledge discovery applications
- Reference material search tool (medical, legal, academic journals/books)
- Document prioritizers
- File management



US Patent # 10,242,090; 9,754,020

DATA SCIENCE

AVAILABLE FOR LICENSING

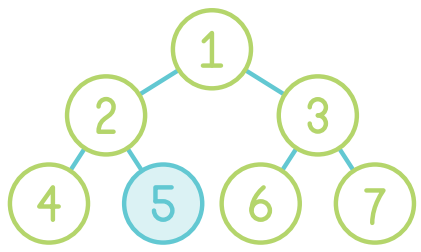
Breadth-first Search Traversal Algorithm

This technology introduces a more efficient model for performing breadth-first search (BFS) on undirected graphs in a distribute system using minimum state information.

BFS is a commonly used algorithm for traversing, or searching, graphs. Using simplified methods and minimal information, this technology can search graphs while minimizing stateful information, reducing the amount of computer memory and data typically needed to search enormous graphs. Any graph algorithm using BFS, including popular matrix-based BFS, can use this technology to improve performance.

POTENTIAL APPLICATIONS:

- GPS mapping
- Network routing
- Database searching



US Patent # 10,191,998

DATA SCIENCE

AVAILABLE FOR LICENSING

Automated Reasoning within and Searching of Documents

This search and discovery technology is an innovative approach to machine-driven processing and automation of document structural and referential indexing. By mapping documents into a reconfigurable Data and Knowledge Model (DKM), this technology identifies relevant features (titles, sections, section titles, authors, references, etc.) enabling improved user searching and enhanced automated document reconstruction based on the Rules Knowledge Base (RKB)'s logical content reasoning. A user interface is provided to discover concepts, documents, keywords, entities, and relationships, while also allowing users to view full documents textually, graphically, or by selecting specific document sections or tags.

POTENTIAL APPLICATIONS:

- Legal research and analysis
- E-Discovery
- Privacy audits
- Compliance programs

US Patent # 10,042,928

PHYSICAL MOBILITY

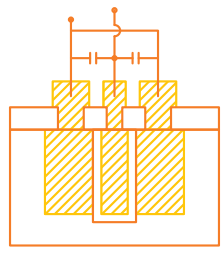
AVAILABLE FOR LICENSING

Vertical Trench Semiconductor Capacitor Design

This technology is a method of fabricating a semiconductor capacitor by depositing the dielectric, or insulator, independently and before the conductor layers. This alleviates issues with poor material quality and reliability. By building the Metal-Insulator-Metal structure differently and forming the insulator first, users are no longer limited to temperature-constrained materials for the insulator. Instead, users can form improved trench capacitors using higher dielectric-constant insulators and integrate a wider range of conductor materials to improve overall capacitor performance.

POTENTIAL APPLICATIONS:

- Increased capacitor power and performance
- Capacitor specific applications including:
  - Integrated circuit power supply decoupling
  - Radio frequency (RF) signal conditioning and filtering applications



US Patent # 10,224,392

CYBER

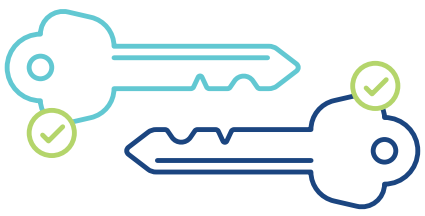
AVAILABLE FOR LICENSING

Validating a Private-Public Key Pair

This technology is a cryptographic method providing a new level of security for key-pair validation, securing both traditional and quantum-resistant protocols for key establishment. Public key validation is a well-known security practice for modern key establishment protocols. While necessary in many proposed post-quantum systems, post-quantum cryptographic algorithms generally do not support direct public key validation. Migrations of modern Internet peer-to-peer communication protocols, such as Internet Key Exchange (IKE) and Transport Layer Security (TLS) to quantum-resistant technology will require a new key validation technique to be secure.

POTENTIAL APPLICATIONS:

- Secure communications (messaging, web browsing, Voice over IP (VoIP)
- Online commerce/shopping website



US Patent # 9,635,003

PHYSICAL MOBILITY

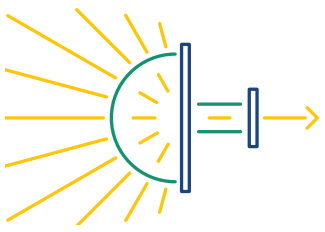
AVAILABLE FOR LICENSING

Wide Field of View Concentrator

This technology, when coupled with a Fresnel lens, concentrates light from a large focal point onto a small spot (0.55mm in diameter) on a detector. A dual lens system allows light focusing despite steering imperfections, poor system placement, or system jostling during use. With long distance free-space optics (FSO), light disperses over a distance due to various factors, resulting in high data error rates detrimental to data transmission accuracy. This design significantly mitigates off-angle collection or steering signal loss and improves the signal focus on the detector.

POTENTIAL APPLICATIONS:

- Low power laser or LED-based communications
- Extends light-based communications systems range
- Increases field and distance for light fidelity (Li-Fi) applications
- Solar photovoltaic (PV) or heat concentration applications



US Patent # 9,383,080