Artificial Intelligence Applications
in Corrections

An overview of artificial intelligence applications and considerations for systems administrators and policy makers

This technology brief is the fourth in a four-part series that examines artificial intelligence (AI) applications in the criminal justice system. This brief highlights applications currently in use in corrections, including institutional corrections (jails and prisons) and community corrections (probation and parole). This brief introduces frameworks for evaluating AI applications, and summarizes critical risks to consider when deploying AI systems. Other briefs in this series provide a high-level overview of AI within the criminal justice system and AI topics related to law enforcement and the criminal courts system.

Key Takeaways

- AI has the potential to improve corrections outcomes, increase efficiency, and reduce cost; however, misusing AI can lead to serious negative and unintended consequences for the entire corrections community.

- AI is unlikely to fully replace humans in corrections and supervision applications, especially in the near term.

- Correctional agencies may be eager to deploy AI solutions; however, decision makers should evaluate opportunities judiciously and prioritize applications with robust data sets.

- AI-enabled technologies provide opportunities to automate certain tasks (e.g., note-taking, data entry, and video surveillance) and increase the efficiency of overburdened officers, freeing them up to perform more valuable activities.

- AI has the potential to improve human decision-making; however, leaders should carefully consider the ethical implications of any AI-enabled system that generates predictions or makes recommendations.

- AI enables more sophisticated surveillance and monitoring. With that in mind, correctional agencies should lead the conversation about tradeoffs between personal privacy and public safety/security objectives.

AI is a technology that will likely transform nearly every industry in the decades ahead, including corrections. This brief (1) offers mental models for corrections leaders to use when evaluating AI applications within their specific domain, (2) presents example AI applications and use cases, and (3) highlights key risk considerations within the corrections landscape. It is important for corrections leaders to understand the fundamental capabilities and risks of AI before applying AI technologies to outstanding needs in corrections and reentry—including needs in jails, prisons, and community supervision.

Resources for Considering AI in Criminal Justice Applications

This document explores AI within corrections.

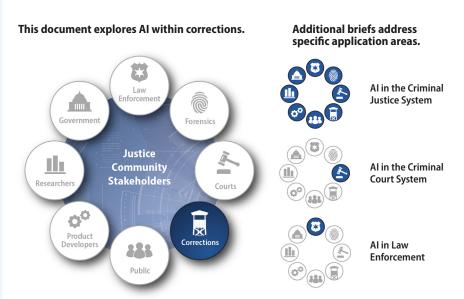**Additional briefs address specific application areas.**

Figure 1: Implementing AI impacts all stakeholders in the criminal justice community. Briefs in this series frame AI within the community and focus on AI applications in law enforcement, criminal courts, and corrections.

An Introduction to AI

AI is often misconstrued as a single technology. In reality, **AI is a broad discipline within computer science that encompasses a wide range of methods that seek to create machines that mimic human intelligence.** There are several different approaches to creating AI, and each has its strengths and limitations. Advances in machine learning and computing hardware—combined with the recent explosion of available data—have paved the way for new AI applications and capabilities.

In the first brief of this four-part series, we took a deeper dive into the fundamentals of AI; AI's recent history; and the application types AI can enable—including **machine vision, natural language processing, robotic process automation, and predictive analytics**. Today's AI systems are generally much better at recognizing data patterns—including video/image data, text data, and numerical data—and using those patterns to perform tasks or make recommendations.

"Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don't think AI will transform in the next several years."

—Andrew Ng, Co-Founder of Coursera and Professor at Stanford University

Identifying AI's Value for Corrections

Implementing AI in corrections has the potential to impact a wide range of agency operations. **Design thinking**, which focuses on identifying and solving a problem first rather than looking for ways to use a new technology, can help corrections administrators and policy makers identify appropriate AI applications. (Refer to the *Artificial Intelligence in the Criminal Justice System* brief for more information.) Design thinking is an approach to innovation that emphasizes deep understanding of the problem, its context, and constraints before deciding which solution is best.[1] A crucial step of design thinking is to identify what AI would be helping with (e.g., completing a task or making a decision) and determining the level of AI assistance, which can range from providing assistance to completely automating tasks. Within corrections, AI will not always be the best or most appropriate solution for a given problem. **Figure 2** highlights four levels of AI involvement—from no AI involvement up to full automation, which involves removing humans from the decision or task loop.
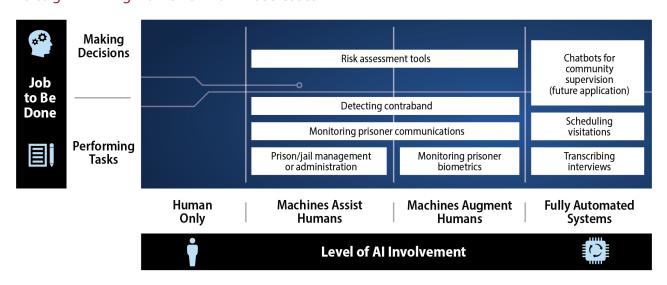
A Design Thinking Framework for AI Use Cases

Figure 2: Design thinking can help identify use cases for AI by considering the level of AI involvement in the job to be done.

1. Linke, R. (2017) *Design thinking, explained*. Retrieved from https://mitsloan.mit.edu/ideas-made-to-matter/design-thinking-explained

AI-enabled solutions may **improve efficiency**, **increase data-driven practices,** or **expand capabilities** for specific tasks or decisions. Broadly speaking, AI solutions can help the corrections field **make decisions** and **perform tasks. Figure 3** provides a few of the decisions and tasks that occur in correctional settings.

Within corrections, various levels of AI involvement will be appropriate for different use cases, and implementing AI does not always entail removing or replacing human expertise. AI applications that remove humans from the loop are often higher risk and more socially contentious. As such, near-term applications within corrections are expected to assist or augment human ability to make data-driven decisions rather than to remove humans from tasks or decision-making processes.

Example Decisions and Tasks within Corrections and Community Supervision

	Make a Decision	Perform a Task
Jails	Determine whether a pretrial defendant should be detained. Select which rehabilitation services or type of supervision are needed for defendants.	Complete intake forms and risk/needs assessments. Aid in processing discharges.
Prisons	Assign cellmates and units. Select appropriate services for inmates. Respond appropriately to behavioral issues. Determine whether a prisoner should be granted parole.	Detect contraband. Translate or transcribe calls in real-time. Monitor inmate communications. Predict inmate risk based on past records, interactions with other inmates, and prior misbehavior. Keep prisoners and officers safe and healthy.
Community Supervision	Develop a plan to prevent recidivism and promote positive, thriving outcomes. Select appropriate client services and connect clients with service providers in an efficient manner. Provide support to community supervision officers (CSOs).	Schedule client check-ins and issue reminders. Test for drug use. Monitor location.

Figure 3: AI may one day assist with many tasks and decisions in correctional settings.

"The use of technology in community corrections has expanded greatly in the past decade. The need to manage increasing caseloads with diminishing resources has driven the field to embrace innovations designed to improve the delivery of community corrections services."

—Leveraging Technology to Enhance Community Supervision: Identifying Needs to Address Current and Emerging Concerns Report[2]

2. Russo, J., Woods, D., Drake, G. B., & Jackson, B. A. (2019). *Leveraging technology to enhance community supervision: Identifying needs to address current and emerging concerns*. Santa Monica, CA: RAND Corporation. Retrieved from https://www.rand.org/content/dam/rand/pubs/research_reports/RR3200/RR3213/RAND_RR3213.pdf

Examples of AI in Corrections

The following examples highlight applications for AI that are currently being developed, trialed, or implemented in different places around the world. Agencies must carefully consider both benefits and costs associated with adopting AI, just as they would with the adoption of any other technological advancement.

Highlighting these examples does not mean that these applications (1) will be successful or (2) have been implemented ethically or cost effectively. Instead, these examples illustrate new approaches so that decision makers can monitor progress or engage in further discussion with the trial originators.[3]

Monitoring Prisoner Communications

A 2019 report from the RAND Corporation highlighted unmonitored inmate communications as a priority concern for correctional institution security.[4] The report's key findings stated that "technology is needed to automate analysis of inmate communications." According to John Shaffer, one of the report authors, "One of the biggest operational issues that has plagued this industry of automated inmate telephone recording has been the lack of staffing to monitor every single call… And, frankly, most inmate calls are innocuous."

AI technologies can assist humans with reviewing hours of inmate communications and flagging potentially problematic communications for human review. Several of the nation's largest phone service providers for prisons and jails are developing advanced call analytics capabilities, and these service providers have highlighted examples in which the technology has helped to detect problematic behavior.[5]

Monitoring prisoner locations, biometrics, and internal communications

The governments of China and Hong Kong recently announced that they will use AI to monitor prisoners using Fitbit-like devices that track location and biometrics, such as heart rate, at all times.[6] Corrections leaders will have to have ongoing conversations about the benefits and drawbacks of introducing such systems in the U.S. Other prisons in China use networked cameras armed with facial recognition and other AI capabilities to "recognize, track, and monitor every inmate around the clock… [generating] a comprehensive report, including behavioral analysis, on each prisoner using different AI functions such as facial identification and movement analysis."[7]

Detecting contraband

Machine vision and image analysis are common applications of AI. The same image analysis tools developed for other industries are being used to improve contraband detection inside correctional facilities.[8] Vendors of this technology also tout the technology's ability to detect irregular activity in security footage, which allows for existing data to be used—data that many correctional facilities already collect.[9]

Contraband inside correctional facilities is consistently a high-priority problem for administrators. AI-enabled image analysis tools may provide additional contraband detection capabilities and increase officer bandwidth by (1) freeing correctional officers from having to review all video and (2) flagging problem videos for manual review. Using biometrics has long been shown to make inmate monitoring more efficient[10]; however, other countries are now investing in a combination of biometric and facial identification technologies to document prison visitors to combat prison drug trafficking.[11]

3. Example products and vendor technologies are provided solely as illustrative examples. The Criminal Justice Testing and Evaluation Consortium does not endorse any specific product or vendor. Mentions of companies and/or products do not represent approval or endorsement by the National Institute of Justice.

4. Russo, J., Woods, D., Shaffer, J. S., & Jackson, B. A. (2019). *Countering threats to correctional institution security: Identifying innovation needs to address current and emerging concerns*. Santa Monica, CA: RAND Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RR2933.html

5. Francescani, C. (2019, October 24). US prisons and jails using AI to mass-monitor millions of inmate calls. *ABC News*. Retrieved from https://abcnews.go.com/Technology/us-prisons-jails-ai-mass-monitor-millions-inmate/story?id=66370244

6. Bala, N., & Trautman, L. (2019, April 30). "Smart" technology is coming for prisoners, too. Slate. Retrieved from https://slate.com/technology/2019/04/smart-ai-prisons-surveillance-monitoring-inmates.html

7. Chen, S. (2019, April 1). No escape? Chinese BIP jail puts AI monitors in every call 'to make prison breaks impossible.' *South China Morning Post*. Retrieved from https://www.scmp.com/news/china/science/article/3003903/no-escape-chinese-vip-jail-puts-ai-monitors-every-cell-make

8. Berry Johnson, B. (2019, October 24). How new technology takes the guesswork out of inmate screening. Corrections One. Retrieved from https://www.correctionsone.com/products/facility-products/body-scanners/articles/how-new-technology-takes-the-guesswork-out-of-inmate-screening-sF76p9oqjXkLfqwX/

9. Cox, L. (2016, December 14). Using AI to combat contraband in prison. *Disruption Hub*. Retrieved from https://disruptionhub.com/uk-prison-using-ai-stop-contraband/

Enabling more efficient operations

Some of the most impactful AI implementations in other industries have involved streamlining operations or automating mundane administrative tasks. Although these applications do not command the same media attention and often lack the glitz and glamour of other AI tools, they are no less impactful. One example is comprehensive jail or prison management software. Although many corrections facilities already collect data in a database or information management system, AI applications can often be built upon these existing systems to increase efficiency, automate routine paperwork, and generate reports.

Other examples include software that schedules visitations or sends automatic reminders to those under community supervision. AI-enabled transcription software can automate the note-taking or reporting required by community supervision officers (CSOs), decreasing the reporting burden and creating more time for higher-impact activities.

Assessing recidivism risk

Perhaps one of the most hotly debated applications of AI in criminal justice is AI-enabled risk assessment tools. These tools are being used in various places in the criminal justice system to assess recidivism risk and inform decisions about pretrial detention or sentencing. In community corrections, risk and needs assessments may be used to identify the level of supervision required for those on probation or parole. In institutions, it may be used to inform programming assignment for inmates as well as parole decisions. Proponents of these systems highlight the potential to reduce human bias in decision-making.[12] Detractors point to instances in which such systems have been shown to have systemic bias embedded in the data used to create the systems.[13]

An in-depth discussion of such tools is beyond the scope of this brief. However, an important point to consider is that many departments already use guidelines or tools to inform decisions about offender risk; the application of AI to these decision-making processes is meant to make data-driven decisions easier and minimize personal biases. However, the corrections community should continue to be involved in the ongoing conversations that will ultimately determine if and how these systems will be used.[14]

Enabling chatbots for community supervision

Virtual assistants and chatbots are proliferating across customer service applications in many industries. AI improvements to natural language processing capabilities have enabled digital assistants or chatbots to take over many mundane tasks formerly performed by humans. Medical providers send automated appointment reminders via text. Customer service chatbots handle routine tasks and route more difficult queries to human agents. Several Silicon Valley startups are even creating AI chatbots that provide first-line mental health services.[15] In corrections, apps like cFIVE Catalyst and Scram Systems streamline appointment scheduling, messaging, and questionnaires to support remote supervision. Similarly, software from companies like TrackTech automates some aspects of rehabilitative support and compliance monitoring and incorporates advanced analytics to improve platform features.

Although human contact and in-person interaction are often crucial in community supervision, the use of chatbots can serve a valuable complementary role to face-to-face meetings between CSOs and offenders. More research is needed, though one could envision new modes of engagement with former prisoners that support successful reentry.

10. Miles, C. A.; Cohn, J. P. (2006, January 1). Tracking Prisoners in Jail With Biometrics: An Experiment in a Navy Brig. National Institute of Justice Journal. Retrieved from https://nij.ojp.gov/topics/articles/tracking-prisoners-jail-biometrics-experiment-navy-brig

11. Burt, C. (2019, March 6). Biometrics and AI vision technologies deployed in Hong Kong and UK prisons to prevent drug use. Retrieved from https://www.biometricupdate.com/201903/biometrics-and-ai-vision-technologies-deployed-in-hong-kong-and-uk-prisons-to-prevent-drug-use

12. Watney, C. (2017). It's time for our justice system to embrace artificial intelligence. *Brookings*. Retrieved from https://www.brookings.edu/blog/techtank/2017/07/20/its-time-for-our-justice-system-to-embrace-artificial-intelligence/

13. Hao, K. (2019). AI is sending people to jail—and getting it wrong. *MIT Technology Review*. Retrieved from https://www.technologyreview.com/s/612775/algorithms-criminal-justice-ai/

14. Additional resources related to risk assessment tools, see Handbook of Recidivism Risk/Needs Assessment Tools, First Edition, and Report on Algorithmic Risk Assessment Tools in the U.S. Criminal Justice System.

15. de Jesus, A. (2019, December 13). *Chatbots for mental health and therapy: Comparing 5 current apps and use cases*. Emerj. Retrieved from https://emerj.com/ai-application-comparisons/chatbots-mental-health-therapy-comparing-5-current-apps-use-cases/

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Three Key Considerations for Leaders in the Corrections Community

1. **Leaders can lower the risks of using AI by considering the fairness, accountability, transparency, privacy, and security of proposed AI solutions prior to implementation.**

   Within corrections, ethical considerations should be a part of every AI discussion. Anytime AI is involved in performing a task or making a decision—even if AI is assisting rather than automating the job—leaders must answer questions around the ethical use of AI. Many organizations, from the Institute of Electrical and Electronics Engineers[16] to the Partnership on AI,[17] are convening leaders to engage in ongoing discussions around ethical use of AI technology. Corrections leaders should engage in similar conversations about the ethical application of AI within the corrections community. The first brief in this series provides criminal justice leaders with a summarized overview of ethical considerations and key questions that can serve as a starting point for these critical conversations.

2. **High-quality data are an essential prerequisite to developing new AI applications in corrections.**

   As AI technologies continue to mature, data quality and integration could limit applications across the landscape of corrections. Many AI algorithms rely on machine learning, a specific type of AI that uses existing examples to "learn" patterns or make predictions. An essential prerequisite to applications that utilize machine learning is an abundance of high-quality data; tens of thousands, or sometimes hundreds of thousands, of examples are often needed to "train" the algorithm.

   Furthermore, AI cannot make up for data that are not collected, and lack of appropriate data can be an intractable operational limitation in implementing AI solutions. The data collection practices within corrections and community supervision today are laying the foundation for future AI applications. As corrections facilities update and change their information management systems, maintaining the accessibility of past records can be key to creating usable datasets for AI algorithms. Moreover, it is important to consider that any bias embedded in these data will result in algorithms that exhibit that same bias. The data used to train AI systems must be carefully considered prior to system development.

   Similarly, **identifying evidence-based interventions that improve corrections outcomes also requires high-quality data**. Barriers to collecting or integrating high-quality data across the corrections landscape may include data silos (i.e., data being stored in different systems that do not integrate with each other), non-digitized data, poor data controls, and lack of standardization. To that end, ensuring that legacy system data can be properly migrated to current record management systems will be integral in leveraging past data collection efforts. Both policy makers and system administrators can advance the identification of evidence-based interventions and development of impactful AI applications by prioritizing high-quality data collection.

AI R&D to Support Community Supervision: Integrated Dynamic Risk Assessment for Community Supervision (IDRACS)

The risk of recidivism is a principal concern for leaders in corrections. Being able to predict who is most at risk to commit a crime and when would be invaluable for both CSOs in the field and departments managing ever-increasing caseloads. Through support from the National Institute of Justice, RTI and its research partners are working with the Georgia Department of Community Supervision (DCS) to improve the prediction of recidivism and better understand the dynamic nature of the risk of reoffending. Researchers will use historical data paired with data collected during their supervision term to create personalized risk profiles for those under supervision, alerting CSOs in near real-time when certain clients may require more attention or scrutiny. This tool will integrate with Georgia DCS's existing information systems to help CSOs prioritize their caseload while efficiently directing services and attention and maximizing reach.

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16. IEEE.org. (2020). *Ethics in action*. Retrieved from https://ethicsinaction.ieee.org/

17. Partnership on AI. (n.d.). Retrieved from https://www.partnershiponai.org/

3. Although AI has advanced in recent years, there are still operational limitations to its use.

Implementing AI systems often requires potentially difficult process or behavioral changes or changes that cause resistance from ecosystem participants. The best AI use cases will consider the ethical appropriateness, operational achievability, and technical feasibility.

Corrections-specific applications will require more investment than industry-agnostic applications. Although most new AI applications within corrections will require new data, there may be ways for the corrections community to leverage AI-powered tools that are being developed outside of the criminal justice community and are industry agnostic. For example, facial recognition technology is being developed for many different applications—from unlocking cell phones to verifying identities as passengers board airplanes[18] —and does not rely on corrections-specific data. Investments from other sectors will advance the technical capabilities of facial recognition and other industry-agnostic applications at a faster rate than industry-specific applications, such as predicting rates of recidivism for parole decisions.

Use cases that leverage these industry-agnostic capabilities may not require as much technical development. The same facial recognition technology developed for cell phones or airlines could be used in the corrections setting without significant modifications to the underlying technology. For example, eHawk uses facial recognition technology as part of its remote monitoring app. Similarly, real-time translation software powered by AI will continue to mature as it is developed for other applications and can easily be used in corrections settings where it adds benefit.

Future Outlook

AI is here to stay, and advances in technical capabilities will continue. The criminal justice community faces shrinking budgets and a growing sense of mistrust from the community. With these things in mind—and considering ethical appropriateness, technical feasibility, and operational limitations—AI provides important opportunities to improve the criminal justice system. Opportunities to implement AI tools should be met with a clear understanding of the data requirement and use a design thinking approach to evaluating potential use cases. This series of briefs aims to inform decision makers about what is already happening in the criminal justice ecosystem and what is required to utilize emerging AI technologies in a thoughtful, informed, and unbiased way.

The NIJ continues to support a portfolio of AI research projects in areas such as public safety video and image analysis, DNA analysis, gunshot detection, and crime forecasting.[19] Looking ahead to the future, different countries and states are likely to adopt AI technologies for criminal justice applications at different rates, which presents an opportunity for learning through collaboration. Improving criminal justice outcomes through the use of AI-enabled technologies will require intentional investment, careful consideration, and sustained efforts from criminal justice decision makers. If designed and implemented well, AI-enabled tools have the potential to improve efficiency, reduce costs, and expand capabilities across many criminal justice use cases.

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18. Steele, K. (2019, December 8). Delta expands optional facial recognition boarding to new airports, more customer. *Delta News Hub*. Retrieved from https://news.delta.com/delta-expands-optional-facial-recognition-boarding-new-airports-more-customers

19. Christopher Rigano, "Using Artificial Intelligence to Address Criminal Justice Needs," October 8, 2018, nij.ojp.gov: https://nij.ojp.gov/topics/articles/using-artificial-intelligence-address-criminal-justice-needs

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Steven Schuetz
Senior Science Advisor
National Institute of Justice
U.S. Department of Justice
Steven.Schuetz@usdoj.gov
Tel +1-202-514-7663

Jeri D. Ropero-Miller, PhD, F-ABFT
Project Director, CJTEC
RTI International
jerimiller@rti.org
Tel +1-919-485-5685

James Redden
Innovation Advisor
RTI International
jredden@rti.org
Tel +1-919-248-4222

Christopher Inkpen, PhD
Research Sociologist & Demographer
Division for Applied Justice Research
Corrections and Reentry Research Program
RTI International
cinkpen@rti.org
Tel +1-919-541-6411

Matthew DeMichele, PhD
Director
Center for Courts and Corrections Research
Division for Applied Justice Research
RTI International
mdemichele@rti.org
Tel +1-919-541-6452

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