

References

- Alexander, M. (2018) The newest Jim Crow: recent criminal justice reforms contain the seeds of a frightening system of “e-encarceration”. *New York Times* November 8th, <https://www.nytimes.com/2018/11/08/opinion/sunday/criminal-justice-reforms-race-technology.htm>
- Amhed S. & Walker, C., (2018) There have been on the average 1 school shooting every week this year. *CNN* posted May 25th, 2018. <https://www.cnn.com/2018/03/02/us/school-shootings-2018-list-trnd/index.html>
- Arrow, K. (1950) A difficulty in the concept of social welfare. *Journal of Political Economy* 58(4) 328–346.
- Benjamin, D. J., Berger, J. O., Johannesson, M., Nosek, B. A., Wagenmakers, E.–J., Berk, R., Bollen, K. A., Brembs, B., Brown, L., Camerer, C., Cesarini, D., Chambers, C. D., Clyde, M., Cook, T. D., De Boeck, P., Dienes, Z., Dreber, A., Easwaran, K., Efferson, C., Fehr, E., Fidler, F., Field, A. P., Forster, M., George, E. I., Gonzalez, R., Goodman, S., Green, E., Green, D. P., Greenwald, A., Hadfield, J. D., Hedges, L. V., Held, L., Ho, T.–H., Hoijsink, H., Jones, J. H., Hruschka, D. J., Imai, K., Imbens, G., Ioannidis, J. P. A., Jeon, M., Kirchler, M., Laibson, D., List, J., Little, R., Lupia, A., Machery, E., Maxwell, S. E., McCarthy, M., Moore, D., Morgan, S. L., Munafó, M., Nakagawa, S., Nyhan, B., Parker, T. H., Pericchi, L., Perugini, M., Rouders, J., Rousseau, J., Savalei, V., Schönbrodt, F. D., Sellke, T., Sinclair, B., Tingley, D., Van Zandt, T., Vazire, S., Watts, D. J., Winship, C., Wolpert, R. L., Xie, Y., Young, C., Zinman, J., & Johnson, V. E. (2017). “Redefine Statistical Significance.” *Nature Human Behavior* 2: 6–10.
- Berk, R. A. (2008) Forecasting methods in crime and justice. In J. Hagan, K. L. Schepple, and T. R. Tyler (eds.) *Annual Review of Law and Social Science* 4 (173–192). Palo Alto: Annual Reviews.
- Berk, R. A. (2012) *Criminal Justice Forecasts of Risk: A Machine Learning Approach*. New York: Springer.
- Berk, R. A. (2016) *Statistical Learning from a Regression Perspective* second edition New York: Springer.
- Berk, R. A. (2017) An impact assessment of machine learning risk forecasts on parole board decisions and recidivism. *Journal of Experimental Criminology* 13(2): 193–242.
- Berk, R. A. (2019) Accuracy and fairness for juvenile justice risk assessments. *Journal of Empirical Legal Studies*, forthcoming.
- Berk, R. A., Barnes, G., Ahlman, L. & Kurtz, E. (2010) When a second best is good enough: a comparison between a true experiment and a regression discontinuity quasi-experiment. *Journal of Experimental Criminology* 6(2) 217–236.
- Berk, R. A., Brown, L., Buja, A., Zhang, K., & Zhao, L. (2013). ‘Valid post-selection inference. *The Annals of Statistics* 41(2): 802–837.

- Berk, R. A., Kriegler, B., & Baek, J-H. (2006) Forecasting dangerous inmate misconduct: An application of ensemble statistical procedures. *Journal of Quantitative Criminology* 22(2) 135–145.
- Berk, R. A., Sorenson, S. B., & He, Y. (2005) Developing a practical forecasting screener for domestic violence incidents. *Evaluation Review* 29(4): 358–382.
- Berk, R. A., Sherman, L., Barnes, G., Kurtz, E., & Ahlman, L. (2009) Forecasting murder within a population of probationers and parolees: A high stakes application of statistical learning. *Journal of the Royal Statistics Society — Series A* 172 (part I): 191–211.
- Berk, R. A., & Bleich, J. (2013) Statistical procedures for forecasting criminal behavior: a comparative assessment. *Journal of Criminology and Public Policy* 12(3): 515–544, 2013.
- Berk, R. A., Sorenson, S. B., & Barnes, G. (2016) Forecasting domestic violence: a machine learning approach to help inform arraignment decisions. *Journal of Empirical Legal Studies* 13(1): 94–115.
- Berk, R. A., Heirdari, H., Jabbari, S., Kearns, M., & Roth, A. (2018a) Fairness in criminal justice risk assessments: The State of the Art. *Sociological Methods and Research*, in press.
- Berk, R. A., Bjuva, A., Brown, L., George, E., Kuchibhotla, A.K., Sue, W., & Zhau, L. (2018b) Assumption lean regression. arXiv:1806.09014v1 [stat,ME].
- Biau, G., (2012) Analysis of the random forests model. *Journal of Machine Learning Research* 13: 1063–1095.
- Bishop, C. M. (2006) *Pattern Recognition and Machine Learning*. New York: Springer.
- Blumstein, A., & Nakamura, K. (2009) Redemption in the presence of widespread criminal background checks. *Criminology* 47(2): 327–359.
- Boonin, D. (2011) *Should Race Matter?* Cambridge: Cambridge University Press.
- Boonin, D. (2008) *The Problem of Punishment*. Cambridge: Cambridge University Press.
- Borden, H. G. (1928) Factors predicting parole success. *Journal of the American Institute of Criminal Law and Criminology* 19: 328–336.
- Breiman, L. (1996) Bagging predictors. *Machine Learning* 26:123–140.
- Breiman, L. (2001a) Random forests. *Machine Learning* 45: 5–32.
- Breiman, L. (2001b) Statistical modeling: two cultures (with discussion). *Statistical Science* 16: 199–231.
- Breiman, L., Friedman, J.H., Olshen, R.A., & Stone, C.J. (1984) *Classification and Regression Trees*. Monterey, CA: Wadsworth Press.
- Buja, A., Berk, R., Brown, L., George, E., Pitkin, E., Traskin, M., Zhan, K., & Zhao, L. (2018a). Models as approximations — part I: a conspiracy of nonlinearity and random regressors in linear regression.” arXiv:1404.1578
- Buja, A., Berk, R., Brown, L., George, E., Arun Kumar Kuchibhotla, & Zhao, L. (2018b). “Models as approximations — part II: a general theory of model-robust regression.” arXiv:1612.03257
- Buruma, Y. (2004) Risk assessment and criminal law: closing the gap between criminal law and criminology (pp. 41–61). In G. Bruinsma and H. Elffers (eds.) *Punishment, Place, and Perpetrators: Developments in Criminology and Criminal Justice Research*. Portland, OR: Willan Publishing.
- Burgess, E. M. (1928) Factors determining success or failure on parole. In A. A. Bruce, A. J. Harno, E. W. Burgess, and E. W., Landesco (eds.) *The Working of the Indeterminate Sentence Law and the Parole System in Illinois* (pp. 205–249). Springfield, Illinois, State Board of Parole.
- Calderon, A. (2018) A dangerous mind: can neuroscience predict how likely someone is to commit another crime. The Marshall Project, filed 8/14/2018.
- Campbell, J.C., Webster, D., Koziol-McLain, J., Block, C., RhD, Doris Campbell, D., Curry, M.A., Gary, F. Glass, N., McFarlane, J., Sachs, C., Sharps, P., Ulrich, Y., Wilt, S.A., Manganello, J., Xu, X., Schollenberger, J., Frye, V., & Laughon, K. (2003) Risk factors for femicide in abusive relationships: results from a multisite case control study. *American Journal of Public Health* 93(7): 1089–1097.
- Casey, P. M., Warren, R. K., & Elek, J. K. (2011) Using offender risk and needs assessment information at sentencing: guidance from a national working group. National Center for State Courts, www.ncsonline.org/.

- Chen, T., & Guestrin, C. (2016) XGBoost: a scalable tree boosting system. arXiv:1603.02754v3 [cs.LG]
- Chipman, H. A., George, E. I., & McCulloch, R. E. (1998) Bayesian CART model search (with discussion). *Journal of the American Statistical Association* 93: 935–960.
- Chipman, H. A., George, E. I., & McCulloch, R. E. (2010) BART: Bayesian additive regression trees. *Annals of Applied Statistics* 4(1): 266–298.
- Chouldechova, A. (2017) Fair prediction with disparate impact: A study of bias in recidivism prediction instruments. arXiv:1703.00056v1 [stat. AP].
- Cochran, W.G., (1977) *Sampling Techniques*, 3rd Edition. New York: Wiley.
- Coglianesi, C., & Lehr, D. (2017) Regulating by robot: administrative decision making in the machine learning era. *Georgetown Law Journal* 105: 1147–1223.
- Coglianesi, C., & Lehr, D. (2018a) Transparency and algorithmic governance. Working Paper. Penn Program on Regulation, University of Pennsylvania Law School.
- Coglianesi, C., & Lehr, D. (2018b) Algorithm vs. algorithm: placing regulatory use of machine learning in perspective. Working Paper. Penn Program on Regulation, University of Pennsylvania Law School.
- Corbett-Davies, S. & Goel, S. (2018) The measure and mismeasure of fairness: a critical review of fair machine learning. 35th International Conference on Machine Learning (ICML 2018).
- Courtland, R. (2018) The bias detectives. *Nature* 558: 357–360.
- Culp, M., Johnson, K., & Michailidis, G. (2006) ada: an R package for stochastic boosting. *Journal of Statistical Software* 17(2): 1–27
- Dana, J., & Dawes, R. M. (2004). The superiority of simple alternatives to regression for social science predictions. *Journal of Educational and Behavioral Statistics* 29(3): 317–331.
- Dawes, R. M., Faust, D., & Meehl, P. E. (1989). Clinical versus actuarial judgment. *Science* 243(4899): 1668–1674.
- Dean, C. W., & Dugan, T. J. (1968) Problems in parole prediction: a historical analysis. *Social Problems* 15: 450–459.
- Domingos, P. (2015) *The master algorithm: how the question for the ultimate learning machine will remake our world*. New York: Basic Books.
- Efron, B., & Tibshirani, R. J. (1993) *An Introduction to the Bootstrap* London: Chapman & Hall.
- Efron, B., & Hastie, T. (2016) *Computer Age Statistical Inference*. Cambridge: Cambridge University Press.
- Elzayn, H., Jabbari, S., Jung, C., Kearns, M., Neel, S., Aaron Roth, A., & Schutzman, Z. (2018) Fair algorithms for learning in allocation problems. In Proceedings of ACM Conference on Fairness, Accountability, and Transparency (ACM FAT*’18).
- Farrell, D. (2003) The justification for general deterrence. In D. Matravers, and J. Pike (eds.) *Debates in Contemporary Political Philosophy: An Anthology*. New York: Routledge.
- Farrington, D. P. & Tarling, R. (1985) *Prediction in Criminology*. Albany: SUNY Press.
- Feeley, M., & Simon, J. (1994). Actuarial justice: The emerging new criminal law. In D. Nelken (ed.), *The Futures of Criminology* (pp. 173–201). London: Sage Publications.
- Ferguson, A.G. (2017) *The Rise of Big Data Policing: Surveillance, Race, and the Future of Law Enforcement* New York: New York University Press.
- Freedman, D.A. (2009) *Statistical Models* Cambridge, UK: Cambridge University Press.
- Friedman, J. H. (2002) Stochastic gradient boosting. *Computational Statistics and Data Analysis* 38: 367–378.
- GAO. (2017) *Costs of Crime: Experts Report Challenges Estimating Costs and Suggest Improvements to Better Inform Policy Decision*. United States Government Accountability Office, September, 2017.
- Gigi, A. (1990) *Nonlinear Multivariate Analysis* New York: Wiley.
- Glaser, D. (1955) Testing correctional decisions. *The Journal of Criminal Law, Criminology and Police Science* 45: 679–684.
- Goel, S., Rao, J.H., & Shroff, R. (2016) Precinct or prejudice? Understanding racial disparities in New York City’s stop-and-frisk policy. *The Annals of Applied Statistics* 10(1) 365–394.

- Goodyear, D. (2018) Can the manufacturer of tasers provide the answer to police abuse? *New Yorker Magazine*. August 27, 2018, downloaded at <https://www.newyorker.com/magazine/2018/08/27/can-the-manufacturer-of-tasers-provide-the-answer-to-police-abuse>
- Gottfredson, S. D., & Moriarty, L. J. (2006) Statistical risk assessment: old problems and new applications. *Crime & Delinquency* 52(1): 178–200.
- Geurts, P., Ernst, & Wehenkel, L. (2006) Extremely randomized trees. *Machine Learning* 63(1): 3–42.
- Hand, D.J. (2009). Measuring classifier performance: A coherent alternative to the area under the ROC curve. *Machine Learning* 77: 103–123.
- Harcourt, B.W. (2007) *Against Prediction: Profiling, Policing, and Punishing in an Actuarial Age*. Chicago, University of Chicago Press.
- Hastie, R., & Dawes, R. M. (2001) *Rational Choice in an Uncertain World*. Thousand Oaks: Sage Publications.
- Hastie, T. & Tibshirani, R. (1993) *Generalized Additive Models*. New York: Chapman & Hall/CRC.
- Hastie, T., Tibshirani, R., & Friedman, J. (2009) *The Elements of Statistical Learning*. Second Edition. New York: Springer.
- Heller, K. (2012) Karen Heller: Philadelphia’s murder rate is a deadly, costly epidemic. *Philadelphia Inquirer* January 4, 2012.
- Heissel, J.A., Sharkey, P.T., Torrats-Espinosa, G., Grant, K., & Adam, E.K. (2017) Violence and vigilance: the acute effects of community violent crime on sleep and cortisol. *Child Development*, published online, <https://doi.org/10.1111/cdev.12889>.
- Henry, V.E. (2003) *The Compstat Paradigm*. New York: Loose Leaf Law Publications.
- Ho, T.K. (1998) The random subspace method for constructing decision trees. *IEEE Transactions on Pattern Recognition and Machine Intelligence* 20 (8) 832–844.
- Huq, A.Z. (2019) Racial equality in algorithmic criminal justice. *Duke Law Journal* 68, forthcoming.
- Hyatt, J.M., Chanenson, L. & Bergstrom, M.H. (2011) Reform in motion: the promise and profiles of incorporating risk assessments and cost-benefit analysis into Pennsylvania Sentencing. *Duquesne Law Review* 49(4): 707–749.
- Hvistendahl, M. (2016) Crime forecasters *Science* 353(6307): 1484–1487.
- Kearns, M.J. & Vazirani U.V. (1996) *An Introduction to Computational Learning Theory* Cambridge: MIT Press.
- Kearns, M., Neel, S., Roth, A., & Wu, Z. (2018a) Preventing fairness gerrymandering: auditing and learning subgroup fairness. arXiv:1711.05144v4 [cs.LG].
- Kearns, M., Neel, S., Roth, A., & Wu, Z. (2018b) An empirical study of rich subgroup fairness for machine learning. asXiv:1808.08166v1 [cs.LG]
- Kuchibhotla, A., Brown, L., Buja, A., George, E., & Zhao, L. (2018) A model free perspective for linear regression: uniform-in-model bounds for post-selection inference. arXiv:1802.05801v2 [math.ST]
- Kiehl, K.A., Anderson, N.E., Aharonie, E., Maurer, J.M., Harenski, K.A., Rao, V., Claus, E.D., Harenski, C., Koenigs, M., Decety, J., Kosson, D., Wager, T.D., Calhoun, V.D., & Steel, V.R. (2018) Age of gray matters: Neuroprediction and recidivism. *Neuroimage: Clinical* 19: 813–823.
- Kleinman, M., Ostrom, B. J., & Cheeman, F. L. (2007) Using risk assessment to inform sentencing decisions for nonviolent offenders in Virginia. *Crime & Delinquency* 53(1): 1–27.
- Kleinberg, J., Lakkaraju, H., Loskovec, J., Ludwig, J., & Mullainathan, S. (2017a) Human decisions and machine predictions. *Quarterly Journal of Economics* 133(1): 237:293.
- Kleinberg, J., Mullainathan, S., & Raghavan, M. (2017b) Inherent tradeoffs in the fair determination of risk scores. Proc. 8th Conference on Innovations in Theoretical Computer Science (ITCS).
- Knuth, D., (1968) *The Art of Computer Programming: Fundamental Algorithms* New York: Addison Wesley.
- Kroll, J.A., Huey, J., Barocas, S., Felten, E.W., Reidenberg, J.R., Robinson, D.G., & Yu, H. (2018) Accountable algorithms. *University of Pennsylvania Law Review* 165: 633–705.

- Leeb, H., & Pötscher, B.M. (2005) Model selection and inference: facts and fiction,” *Econometric Theory* 21: 21–59.
- Leeb, H., & Pötscher, B.M. (2006) Can one estimate the conditional distribution of post-model-selection estimators? *The Annals of Statistics* 34(5): 2554–2591.
- Lobo, J. M.; Jiménez-Valverde, A., & Real, R. (2008). AUC: a misleading measure of the performance of predictive distribution models. *Global Ecology and Biogeography* 17: 145–151.
- Macmillan, R. (2002) Statistics: costs of crime. *Encyclopedia of Crime and Justice*. Encyclopedia.com. 16 Aug. 2018 <http://www.encyclopedia.com>
- McCaffrey, D.F., Ridgeway, G., & Morral, A. (2004). Propensity score estimation with boosted regression for evaluating adolescent substance abuse treatment. *Psychological Methods* 9(4): 403–425.
- Mease, D., Wyner, A.J., & Buja, A. (2007) Boosted classification trees and class probability/quantile estimation. *Journal of Machine Learning Research* 8: 409–439.
- Megargee, E.I., Carbonell, J.L. & Mercer, S.J. (1999) MMPI-2 with male and female state and federal prison inmate. *Psychological Assessment* 11(2): 177–185.
- Messing, J.J., Campbell, J., Webster, D.W., Brown, S., Patchell, B., & Wilson, J.S. (2015) The Oklahoma lethality Assessment Study: A Euasi-Experimental Evaluation of the Lethality Assessment Program. *Social Service Review* 89(3):499–530.
- Messing, J.J., Campbell, J., Wilson, J.S., Brown, S., & Patchell, B. (2017) The lethality screen: the predictive validity of an intimate partner violence risk assessment for use by first responders. *Journal of Interpersonal Violence* 32(2): 205–226.
- Messinger, S.L., & Berk, R.A. (1987) Dangerous people: a review of the NAS report on career criminals. *Criminology* 25(3): 767–781
- Monahan, J. (1981) *Predicting Violent Behavior: An Assessment of Clinical Techniques*. Newbury Park: Sage Publications.
- Monahan, J. (2006) A jurisprudence of risk assessment: forecasting harm among prisoners, predators, and patients. *Virginia Law Review* 92: 391–435.
- Monahan, J., & Solver, E. (2003) Judicial decision thresholds for violence risk management. *International Journal of Forensic Mental Health* 2(1):1–6.
- Ohlin, L. E., & Duncan, O. D. (1949) The efficiency of prediction in criminology. *American Journal of Sociology* 54: 441–452.
- Ohlin, L. E., & Lawrence, R. A. (1952) A comparison of alternative methods of parole prediction. *American Sociological Review* 17: 268–274.
- Perry, W.L., McInnis, B., Price, C.C., & Hollywood, J.S. (2013) *Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations* Santa Monica, CA: Rand Corporation.
- Petzold, C. (2008) *The annotated Turing: a guided tour through Alan Turing’s historic paper on computability and the Turing Machine*. New York: Wiley.
- Pew Center of the States, Public Safety Performance Project (2011) Risk/needs assessment 101: science reveals new tools to manage offenders. The Pew Center of the States. www.pewcenteronthestates.org/publicsafety.
- Reiss, A. J. (1951) The accuracy, efficiency, and validity of a prediction instrument. *American Journal of Sociology* 17: 268–274.
- Rice, J. A. (2006) *Mathematical Statistics and Data Analysis*. Third Edition. New York: Duxbury Press,
- Ridgeway, G. (2007) Generalized boosted models: a guide to the gbm package. cran.r-project.org/web/packages/gbm/vignettes/gbm.pdf.
- Robert, D. (2005) Actuarial justice. In M. Bosworth (ed.) *Encyclopedia of Prisons and Correctional Facilities* Vol 1, pp. 11–14. Thousand Oaks, CA: Sage Publications.
- Robinson, D. & Scognigs, C., (2018) The detection of criminal groups in real-world fused data: using the graph-mining algorithm “GraphExtract.” *Security Informatics*, published online, <https://doi.org/10.1186/s13388-018-0031-9>.

- Roehl, J., O'Sullivan, C., Webster, D., & Campbell, J. (2005) Intimate partner violence risk assessment validation study, final report. National Institute of Justice, U.S. Department of Justice.
- Sen, A. (2018) *Collective Choice and Social Welfare* Cambridge: Harvard university Press
- Scharre, P. (2018) *Army of None*. New York: Norton.
- Skeem, J. L., & Monahan, J. (2011) Current directions in violence risk assessment. *Current Directions in Psychological Science* 21(1): 38–42.
- Sánchez, A., & Carne Ruiz de Villa, M. (2018) A tutorial review of microarray data analysis. Working paper, Department of Statistics, University of Barcelona. http://www.ub.edu/stat/docencia/bioinformatica/microarrays/ADM/slides/AA_Tutorial_Review_of_Microarray_data_Analysis_17-06-08.pdf.
- Starr, S.B. (2014) Evidence-based sentencing and the scientific rationalization of discrimination. *Stanford Law Review* 66: 803–872.
- Tan, M., Chen, B., Pang, R., Vasudevan, V. & Le, Q.L. (2018) MnasNet: platform-aware neural architecture search for Mobile. arXiv:1807.11626v1 [cs.CV].
- Tonry, M. (2014) Legal and ethical issues in the prediction of recidivism." *Federal Sentencing Reporter* 26(3): 167–176.
- Ubiñas, H. (2018) In Philly, we're burying our children, not our weapons. *Philadelphia Daily News* at Philly.com, posted August 24th, 2018 http://www2.philly.com/philly/columnists/helen_ubinas/helen-ubinas-philadelphia-violence-erase-the-rate-philadelphia-police-20180824.html.
- von Hirsh, A. (1995) *Censure and Sanctions*. Oxford: Oxford University press.
- Wager, S. & Athey, S. (2017) Estimation and inference of heterogeneous treatment effects using random forests. arXiv:1510.04342v4 [stat.ME].
- Wager, S., Hastie, T., & Efron, B. (2014) Confidence intervals for random forests: the jackknife and the infinitesimal jackknife. *Journal of Machine Learning Research* 15: 1625–1651.
- Wilkins, L. T. (1980) Problems with existing prediction studies and future research needs. *The Journal of Criminal Law and Criminology* 71: 98–101.
- Wilson, C. (2018) This chart shows the number of school shooting victims since Sandy Hook. *Time Magazine*, posted February 22nd, 2018. <http://time.com/5168272/how-many-school-shootings/>.
- Zeng, J., Ustan, B., & Rudin, C. (2017) Interpretable classification models for recidivism prediction. *Journal of the Royal Statistical Society: Series A* 180(3): 689–722.