

Data Science Expert & AI Strategist



Dr. Mathew Divine

Dr. sc. hum.

Master of Science (M.Sc.) Biomedical Engineering

Bachelor of Science (B.Sc.) Physics and Mathematics

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Executive Summary

I'm an experienced Product Leader with a strong foundation in AI, data strategy, and digital transformation. With 15+ years at the crossroads of science, technology, and business, I've led cross-functional teams turning complex AI capabilities into scalable, user-focused products. My background spans data science, product ownership, and leadership in pharma and healthcare innovation—combining analytical rigor with strategic creativity. I translate business goals into clear product roadmaps, align stakeholders, and drive measurable impact from concept to rollout. Known for coaching teams and fostering collaboration between tech and business, I help organizations leverage AI responsibly to deliver real value. Fluent in English and German, I bring a global perspective to AI-driven innovation.

Professional Experience

01 | 2024 — present

Data Science Expert & AI Strategist — Freelancer

Partnering with organizations to define and execute AI-driven product strategies that align business goals with technical feasibility. I lead discovery, define product requirements, and coordinate cross-functional teams to transform emerging technologies—like generative AI and automation—into tangible business value. Sometimes, I just build it myself.

Skills: Product Strategy, Stakeholder Alignment, Requirements Definition, Roadmapping, Agile Coaching

Technologies: Generative AI, Cloud Platforms (Azure, AWS), Machine Learning, Python, SQL

08 | 2021 — 12 | 2023

Head of Digital Lab (CD&O) / AI Product Owner — Boehringer-Ingelheim

Led the Digital Lab team through Boehringer Ingelheim's digital transformation journey, shaping the strategy and execution of AI-enabled products that accelerated time-to-market and boosted business efficiency.

- **Product Ownership:** Defined vision, roadmap, and backlog for enterprise analytics products integrating with Veeva Vaults, leveraging LLMs for intelligent search and personalization with outsourced dev Team.
- **Strategic Leadership:** Designed and facilitated cross-department workshops to align product direction with business unit goals and stakeholder buy-in.
- **AI & Automation Strategy:** Introduced generative AI capabilities (ChatGPT) for document automation, translation, and redaction—resulting in new vendor onboarding, major time savings, and measurable cost reduction.
- **Team Enablement:** Coached an 8-person digital innovation team from business, fostering a culture of experimentation, agile iteration, and rapid delivery across business units.

Skills: Product Ownership, Strategic Leadership, Stakeholder Engagement, Agile Delivery, Change Management

Technologies: Generative AI, Llama Index, Azure, AWS, Atlassian Suite

- 01 | 2021 — 05 | 2021 **Interim Head of Data Science** — BI X GmbH
- Steered a self-organized data science team, ensuring delivery quality, focus, and alignment with business priorities.
 - Coached Product Owners and team leads to remove blockers and accelerate delivery across multiple AI initiatives.
 - Oversaw staffing and budgeting for new projects, balancing speed, scope, and strategic impact.
 - Maintained standards for data product quality and stakeholder communication.
- Skills:** Strategic Coordination, Team Management, Leadership
Technologies: JIRA, AWS, Atlassian, Git, Python, Machine Learning
- 01 | 2018 — 07 | 2021 **(Senior) Data Scientist** — BI X GmbH
- Delivered AI and data products from concept to deployment, bridging scientific innovation and business value.
 - Developed a clinical data catalog and NLP models uncovering new biomarkers for drug discovery.
 - Built data pipelines and search algorithms improving collaboration and data quality.
 - Initiated GenAI proof-of-concept for molecular design, later adopted for interactive lead optimization.
 - Led development of an AWS-based genomics pipeline identifying 16 novel genetic leads.
- Skills:** AI Product Development, NLP, Data Engineering, Agile Collaboration
Tech: Python, AWS, SQL, TensorFlow, Docker
- 04 | 2016 – 12 | 2017 **Research Scientist, Radiogenomics**, Eberhard Karls University Tübingen
- Aggregated and analyzed high-dimensional datasets including ngs, medical imaging, and gene annotations in clinical trials, allowing physicians to make better treatment decisions
 - Advised students and taught python for Biologists course at the Max Planck
- Skills:** Interdisciplinary Collaboration, Data Engineering.
Technologies: Python, DICOM, TensorFlow, Seaborn, Docker, SQL, NoSQL
- 03 | 2010 – 03 | 2016 **Research Fellow, Oncology (WSIC)**, Eberhard Karls University Tübingen
- Developed Machine Learning pipelines, integrating PET and MRI data to segment tumor microenvironments and validation strategies with histology
 - Co-Authored a Nature Biomedical Engineering Publication demonstrating the translation potential of the aforementioned prognostic biomarker model
- Skills:** Analytical Thinking, Problem-Solving, Project Management
Technologies: MATLAB, PET, MRI

Education

- 03 | 2010 – 03 | 2016 **Doctorate in Molecular Imaging (Dr. sc. hum.)**
Werner Siemens Imaging Center (WSIC), Eberhard Karls University Tübingen
- 10 | 2007 - 02 | 2010 **Masters in Biomedical Engineering (M.Sc.)**
Rheinisch-Westfälische Technische Hochschule (RWTH), Aachen

09 | 2002 – 05 | 2007 **Bachelors in Physics and Mathematics (B.Sc.)**
Midwestern State University (MWSU), Texas, USA
Received competitive Scholarship from Midwestern State University

Further Education

06 | 2022 **Casual Inference Workshop** – Harvard Medical School

01 | 2022 – 06 | 2023 **1-on-1 Management Coaching** – Consulting Impact, Daniel Zacher

01 | 2022 – 06 | 2022 **Executive Education** – Harvard Medical School

2018 | 2020 | 2022 **Design Thinking Facilitator Training** – WeAreNeon

Languages English — Native Language
German — Fluent

Personal Interests Listening to music, playing music with others (bass, electric guitar, drums),
personal fitness

Senior Data Scientist (Boehringer Ingelheim, HP Germany)

- Develop an interactive web app for Sales Reps to ask questions that get answered from the database in natural language with interactive map functionality and trend analysis driven by voice and chat text responsible for the architecture.
- Coaching the junior product owner and the team in agile methodologies.
- Teaching the development team about best practices and developing best practices for ai development. Also bringing this knowledge to the German analytics team, running sessions to show analysts how to use VS Code with Github CoPilot to automate reports, use version control, and knowledge Management

Soft Skills: Product Ownership, Coaching

Hard Skills: Agentic Programming, CI/CD, ETL, Context Modeling

Technologies: Openshift, GitHub CoPilot, Apollo API, Atlassian Stack

Technical Product Owner (Top 20 Pharmaceutical, Germany)

- Responsible for iteratively improving a content recommendation engine, which integrates into Veeva for sales reps to engage with physicians on a specific pharmaceutical product leading an off shore development team in India, and interacting with international and national interdisciplinary team members.
- Engaged with stakeholders to lift the requirements, write stories for the team, plan and execute the agile rituals, review implemented portions. Mentored the team on data science topics and usage of genAI
- Developed reporting data model, automated reports, and responsible for the interactive quality dashboard showcasing KPIs.

Soft Skills: Product Ownership, Coaching, Requirements Gathering

Hard Skills: Data Analysis, Data Extraction

Technologies: AWS Sagemaker, OpenAI API, Jupyter Notebooks, JIRA, Confluence

API for Smart Search for EU-Tenders Platform (Small, Private German Company)

- Built an API to ingest, clean, translate, and index EU tenders documents in Neo4j, enabling hybrid search with RAG and Cypher queries via a Streamlit dashboard
- Deployed the API on AWS Lightsail container services with CI/CD automation via GitHub Actions, ensuring stability through pytest unit and integration tests.

Soft Skills: Requirements Gathering, Project Management, MLOps Strategy

Hard Skills: Hybrid Search, GraphRAG, Knowledge Graph Development, CI/CD, MLOps

Technologies: Neo4j, LangChain, GitHub Actions, Python, AWS LightSail, Docker

Creator of Online Content for a Course on Data Analysis in ChatGPT (Berlin Startup)

- Designed and developed a comprehensive online course to teach data analysis using ChatGPT, aimed at professionals and learners seeking practical, hands-on AI skills
- Created engaging instructional videos complemented by interactive Jupyter notebooks, enabling participants to practice concepts from foundational data analysis principles to best practices in prompt design
- Utilized professional recording tools, including Open Broadcast Software and audio equipment, to ensure high-quality video and audio content for an optimal learning experience

Soft Skills: Curriculum Design, Instructional Delivery, Online Presentation

Hard Skills: Data Visualization, Generative AI Prompt Design, Content Creation

Technologies: ChatGPT, Open Broadcast Software (OBS), Jupyter Notebooks

Project Lead of CRM Cleaning and Development of AI first Web-Scraping Technology (Startup in Essen, Germany)

- Led CRM data normalization and cleaning project, with multiple steps visualized as a data score card flow using a Sankey Diagram, aiding in customer understanding and buy-in to iteratively develop pipeline further increasing revenue for client
- Implemented and validated a genAI first web crawling strategy, outlining data quality challenges, ensuring high quality, and scalability on AWS to augment customer CRM data

Soft Skills: Project Management, Requirements Gathering, Entrepreneurship

Hard Skills: Data Visualization, LLM Prompt Prototyping, Cloud Development

Technologies: AWS-Sagemaker, Python, LangChain, AWS Lambda, Snowflake

Head of Digital Lab, CD&O - Boehringer-Ingelheim

2021-08 - 2023-12

Digital Execution Strategy Development

- Led an 8-person, global, cross-functional team, embedding MLOps best practices to streamline AI-driven cloud deployment and operational execution.
- Developed end-to-end cloud-based ML workflows, aligning business objectives with technical strategy to reduce time-to-market for digital transformation initiatives.
- Established processes for empowered decision-making, driving agile execution across AI product development and strategic alignment.
- Upskilled team on design thinking methodologies, AI strategy, and qualitative user research, ensuring scalability and adaptability in enterprise-wide AI adoption.

Soft Skills: Team Leadership, Strategic Planning, Agile Methodologies, Digital Strategy, Project Management, Qualitative User Research

Hard Skills: Jira, Confluence, Mural, AWS, CI/CD, Cloud-Native AI Development

Digital Transformation in Medical Writing

- Conducted process mapping and qualitative analysis to define AI-driven business use cases, leading to the implementation of automated document processing.
- Led the adoption of generative AI by medical writers, conducting PoCs on LLM-driven document generation, redaction, and translation.
- Performed market scouting and vendor analysis, streamlining the RfP process and ultimately reducing time-to-market for the automation of the Clinical Trials Results.

Soft Skills: Technical Leadership, Cross-Functional Facilitation, Coaching

Hard Skills: LLM Prompt Engineering, genAI, Azure Cognitive Services

Lay Document Generation Using RAG System

- Advised Data Scientists and Medical Writers on LLM prompt engineering, prompt chaining, and AI-powered document structuring for faster content generation.
- Co-Deployed an interactive, cloud-native prototype using Streamlit, enabling seamless AI-assisted content creation for the lay language protocol.

Soft Skills: Technical Leadership, Cross-Functional Facilitation, Product Innovation

Hard Skills: LLM Prompt Optimization, RAG Architecture, CI/CD

Technologies: Python, Llama index, Azure Cognitive Services, OpenShift, Jenkins

Product Owner of Analytics Landing Page

- Served as Product Owner for an AI-driven analytics dashboard, integrating recommendation systems and LLM-based cognitive search for real-time insights.
- Defined product vision, roadmap, and backlog grooming to enhance AI-driven operational data analysis, ensuring seamless business intelligence automation via AI Agents.
- Coordinated with business and technical stakeholders, managing dependencies and aligning expectations for enterprise-wide data-driven decision-making.

Soft Skills: Product Ownership, Innovative Thinking, Stakeholder Management, SCRUM, Agile

Hard Skills: Data Visualization, AI Model Deployment, Cloud Based API Integration

Technologies: LLMs, Azure Cognitive Services, AWS, Jira, Confluence, Git

Development of Bioinformatics Pipelines for Genome Assembly Algorithms

- Led a cross-functional team of developers and scientists in creating validation and innovative bioinformatics pipelines on AWS cloud services.
- The project focused on the development of ultra-fast de novo genome assembly algorithms, leveraging cloud computing for enhanced computational efficiency and accuracy.
- Utilized AWS CDK for infrastructure management and orchestrated various AWS services to streamline the bioinformatics pipeline.

Soft Skills: Team Leadership, Project Management, Cross-Functional Collaboration

Hard Skills: Bioinformatics, Genome Assembly, Pipeline Development, Cloud Computing

Technologies: AWS Batch, AWS IAM, AWS Step Functions, AWS ECS, AWS CodePipeline, Python, Docker, AWS CDK, Jira, Confluence, git

Clinical Data Catalogue

- Developed ETL processes in python on the cloud to produce a clinical data catalogue, integrating clinicaltrials.gov and in-house data for seamless access and aggregation of clinical trial information.
- Utilized Ontologies to normalize clinical data over a twenty-year period.
- Implemented semantic search capabilities, utilizing advanced NLP pipelines and graph data models within a knowledge graph on the cloud.
- My role extended to facilitating the product team's ownership, addressing technical and business challenges, and aligning with internal stakeholders to ensure data governance compliance.

Soft Skills: Collaborative Problem Solving, Interdisciplinary Communication, Qualitative User Research

Hard Skills: Data Modeling, Exploratory Data Analysis, Semantic Search Algorithm Development, Biomedical Ontologies, NLP, SPARQL, Entity Recognition, BERT Transformer Model, CI/CD

Technologies: Python, Jupyter Notebooks, Docker, OpenShift, SPARQL, SQL, Stardog, PostgreSQL, SpaCy, Jira, Confluence, git, Jenkins

Interdisciplinary Hackathon Creating a Gamification of NLP Annotation in a Web App

- Led a 2-day interdisciplinary hackathon project focused on gamifying NLP annotation for entity relationship models.
- Responsibilities included desk research, knowledge resource creation for software developers, UX researchers, and external vendors, and guiding data scientists through NLP pipelines.

- Managed the development of a game that allowed biomedical researchers to validate NLP entity linking models in a gamified approach, enhancing knowledge dissemination in knowledge graphs, gamification, and NLP modeling.

Soft Skills: Team Leadership, Interdisciplinary Collaboration, Vendor Relationship Management

Hard Skills: NLP, Data Visualization, Game Design, Entity Relationship Modeling, Knowledge Graph Utilization

Technologies: Python, TensorFlow, Jupyter Notebooks, SpaCy, SPARQL, Stardog, Jira, Confluence, git

Conceptualization of Bespoke Knowledge Management System Including PoC

- Led the conceptualization of a bespoke knowledge management system, conducting extensive qualitative user research with over 60 company personnel to determine value proposition and feature set.
- Collaborated with key stakeholders in design sprints to test features and developed prototypes using open-source NLP algorithms for advanced question answering and topic modeling.
- Recognized by the board of governors for innovation and worked with in-house IT for further project development.

Soft Skills: User Research, Stakeholder Engagement, Innovative Thinking, Design Thinking, Collaborative Problem Solving

Hard Skills: NLP, Question Answering, Topic Modeling, Prototyping, User-Centered Design

Technologies: Python, TensorFlow, Elasticsearch, Jira, Confluence, git

Interim Head of Data Science - BI X GmbH

2021-01 - 2021-05

- Responsible for Staffing of new initiatives and internal hiring.
- Collaboratively coached digital Product Owners with BI X leadership team.
- Coordinated Strategy with Global Head of Data Science.

Soft Skills: Team Leadership, Agile Methodologies, Digital Strategy, Project Management

Hard Skills: Jira, Confluence, Mural, Office 360

Data Scientist - BI X GmbH

2018-01 - 2018-12

Bespoke Drug Discovery and Market Intelligence Web App

- Led the Data Science development of a web application for drug discovery and market intelligence, focusing on complex ETL processes using Airflow, advanced NLP for entity recognition, and the development of an advanced search feature utilizing biomedical ontologies.
- Actively participated in user interviews alongside UX researchers, providing expertise on biomedical subject matter to inform user-centric design.

Soft Skills: SCRUM Leadership, Team Collaboration, Qualitative User Research, Interdisciplinary Communication, Stakeholder Engagement

Hard Skills: ETL, NLP, CI/CD, Biomedical Data Processing, Search Algorithm Development

Technologies: Postgres, Neo4j, Python, TensorFlow, Airflow, OpenShift, Docker, Jupyter Notebooks, Jira, Confluence, git, Jenkins

Data Science Hackathon Utilizing Generative AI to Generate Novel Medicinal Molecules

- Led a 2-day hackathon project focusing on utilizing generative AI to create novel medicinal molecules.
- Responsibilities included conducting desk research, creating knowledge resources for non-biomedical data scientists, and leveraging advanced AI models for molecule generation and property estimation.
- Collaborated closely with the Medicinal Chemistry Department to align efforts and co-create a new digital initiative.

Soft Skills: Collaborative Problem Solving, Interdisciplinary Communication, Innovative Thinking, Project Management

Hard Skills: Data Visualization, Generative AI Modeling, Molecular Property Estimation, Biomedical Data Analysis

Technologies: Python, Docker, TensorFlow, Jupyter Notebooks, t-SNE, Vector Embeddings, Jira, Confluence, git

Research Scientist, Radiogenomics - Applied Bioinformatics Group, Center for Bioinformatics, Eberhard Karls University Tübingen

2016-04 - 2017-12

Curation and Reporting of high-dimensional and heterogeneous NGS and Biomedical Imaging Datasets

- Collaborating with the Radiology, Nuclear Medicine, Bioinformatics, and the Oncology departments to collect, aggregate and analyze high-dimensional and heterogeneous datasets stemming from an observational clinical trial in hepatocellular carcinoma patients.
- I created workflows for curating NGS data sets with multiple online databases.
- I extracted radiomics features from multi-dimensional imaging data sets and used heatmaps, hierarchical clustering methods, and protein interaction networks to visualize and report insights on the project.
- Created interactive reports for treating physicians and iteratively refined based upon feedback

Soft Skills: Interdisciplinary Collaboration, Interdisciplinary Communication, Innovative Problem Solving, Public Speaking

Hard Skills: Machine Learning, Spectral Clustering, Data Visualization, Data Engineering, Exploratory Data Analysis

Technologies: Python, DICOM, TensorFlow, Seaborn

Clinical Reporting Strategy of Genetic Variations

- Curating genetic variations of individual patients with online databases and scientific publications.
- The aggregation algorithms were containerized for interoperability, and were used for creation of genetic variation reports to help oncologists decide about alternative therapy options for patients not responding to the standard of care.

Soft Skills: Interdisciplinary Collaboration, Interdisciplinary Communication, Public Speaking, Innovative Problem Solving

Hard Skills: Data Engineering, Bioinformatics, Exploratory Data Analysis, Data Modeling

Technologies: REST API, Python, Docker, Cloud Computing

Using Parallel Coordinates to Visualize Hidden Layers in Feed Forward Neural Networks

- Conceptualized an innovative visualization approach for understanding how feedforward neural networks can be visualized with parallel coordinates, and advised master's student to develop interactive web app.
- This approach belongs to the category of explainable AI and allowed for visualization of hidden layers and separability of classes in hidden layers, leading to an intuitive approach to hyper-parameter estimation.

Soft Skills: Coaching, Collaborative Problem Solving, Innovative Problem Solving

Hard Skills: Data Visualization, Neural Networks, Machine Learning, API Development

Technologies: TensorFlow, Python

Development of interactive webapp for visualization of images, no-code creation of neural network architecture, training, hyper-parameter optimization

- Conceptualized an innovative workflow tool to visualize large imaging data sets, interactively create neural convolutional auto-encoder architectures, train neural networks, visualize latent representation, and perform batch processing for hyper-parameter estimation.
- I advised a master's student to develop the corresponding, interactive web app. This is an important tool for no-code development of transfer learning techniques for convolutional neural networks and un-supervised clustering and classification of imaging datasets.

Soft Skills: Coaching, Collaborative Problem Solving, Innovative Problem Solving

Hard Skills: Data Visualization, Convolutional Neural Networks, Machine Learning, Transfer Learning, Clustering

Technologies: Python, TensorFlow

Utilizing Biological Interaction Networks to Aggregate NGS and Molecular Imaging Data, defining highly disrupted pathways

- Conceptualized a technique to map molecular imaging and NGS data sets to KEGG protein-protein interaction networks and advised a doctoral student to implement the technique.
- This led to a reduction of the dimensionality of the NGS and imaging features, and allowed for introspection of the indicated molecular pathways, which overlapped for a small cohort of patients.
- This represents a novel technique for combining disparate biomedical data sets and pathways analysis.

Soft Skills: Coaching, Collaborative Problem Solving, Innovative Problem Solving

Hard Skills: Biological Network Visualization, Network Path Analysis

Technologies: Python, KEGG, Cytoscape

Research Fellow, Oncology, Werner Siemens Imaging Center, Department of Preclinical Imaging and Radiopharmacy, Eberhard Karls University Tübingen 2010-03 - 2016-03

Development of Gaussian Mixture Modeling Pipeline for Tumor Microenvironment Analysis

- Conceived and co-developed a novel Gaussian mixture modeling (GMM) pipeline integrating 18F-FDG PET and diffusion-weighted MRI (DW-MRI) data.
- The project aimed to segment the tumor microenvironment into distinct tissue compartments and monitor their evolution over time.
- Successfully demonstrated the pipeline's ability to segment tumor tissue accurately and establish a linear correlation between ADC and 18F-FDG values, suggesting its potential for advancing disease outcome assessment into precision medicine.

Soft Skills: Analytical Thinking, Problem-Solving, Interdisciplinary Research, Scientific Communication, Project Management

Hard Skills: Data Analysis, Gaussian Mixture Modeling, PET/MRI Data Integration, Precision Medicine Research, Image Processing, Histopathology, Machine Learning

Technologies: MATLAB, Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI)

Multiparametric MRI Tumor Tissue Segmentation Study

- Initiated and led a study introducing an unsupervised segmentation method using multiparametric MRI to quantify diverse tumor tissue types.
- The study involved comparing this novel approach with existing segmentation techniques and validating the results against histological samples. Findings indicated that the new method accurately quantified the fractional populations of necrotic, perinecrotic, and viable tumor tissues, aligning closely with histological analyses.

- The implications of this research may significantly improve cancer treatment planning and improve MRI-guided tumor biopsies.

Soft Skills: Critical Analysis, Innovative Problem Solving, Cross-Disciplinary Collaboration, Data Interpretation, Research Funding Acquisition

Hard Skills: MRI Image Segmentation, Unsupervised Learning Algorithms, Histological Data Validation, Cancer Treatment Planning, Biopsy Procedure Enhancement, Histopathology

Technologies: MATLAB, Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI)

Spectral Clustering for Tumor Heterogeneity Assessment in Dynamic 18F-FDG PET Studies

- This research project explored spectral clustering (SC) techniques for assessing tumor heterogeneity in dynamic 18F-FDG PET imaging studies.
- The study meticulously validated the SC approach against simulations of tumor tissue types and existing methods like compartmental modeling and SUV segmentation.
- The findings underscored SC's robustness in quantifying tumor heterogeneity and its capability for voxel-level characterization of tumor microenvironments, marking a significant step forward in the field of oncological imaging.

Soft Skills: Innovative Research, Analytical Thinking, Scientific Communication, Data Validation, Cross-Disciplinary Collaboration

Hard Skills: Spectral Clustering, Tumor Heterogeneity Quantification, Dynamic PET Data Analysis, Simulation and Modeling, Image Segmentation, Machine Learning

Technologies: MATLAB, Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI)

Spatial Characterization of Intratumoural Heterogeneity via PET-MRI and Machine Learning

- This project unveiled a cutting-edge approach to characterize intratumoural heterogeneity spatially through phenotype-specific, multi-view learning classifiers using dynamic PET and multiparametric MRI data.
- The research demonstrated the classifiers' capability to quantify phenotypic changes from targeted therapies in colon cancer models and align with tumour histology in patients with liver metastases from colorectal cancer.
- The application of this novel method in both preclinical and clinical settings underscores its significance in enhancing precision oncology.

Soft Skills: Machine Learning Application, Interdisciplinary Collaboration, Innovative Problem-Solving, Scientific Research Communication

Hard Skills: Multimodal Imaging Analysis, Machine Learning Classifier Development, Phenotypic Analysis, Dynamic PET-MRI Integration, Biostatistics

Technologies: MATLAB, Positron Emission Tomography (PET), Magnetic Resonance Imaging (MRI)